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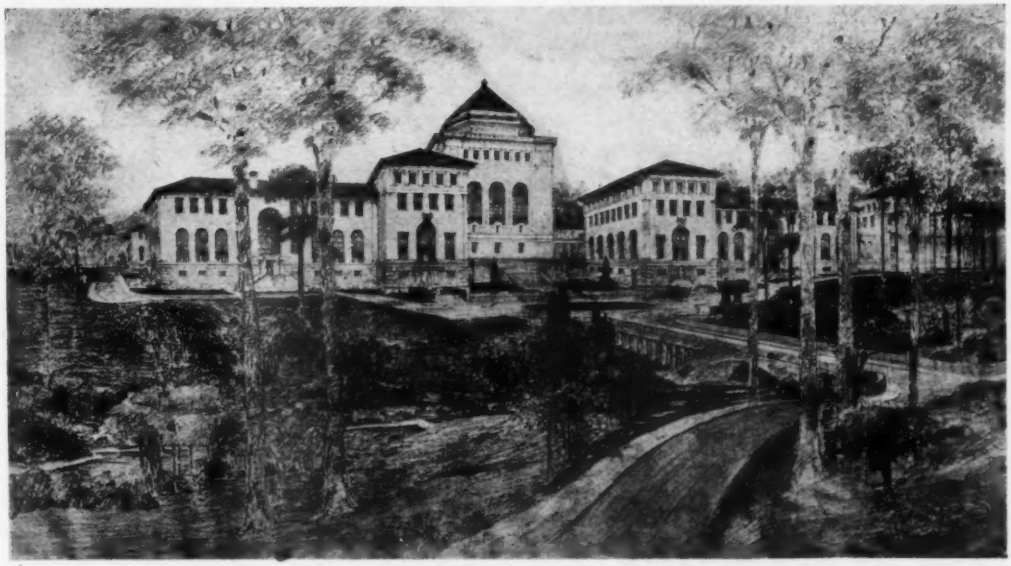

EAST ELEVATION ACADEMIC BUILDINGS
Approach is by concrete bridge over the ravine.

Emory University, Atlanta, Georgia.

H. HORNBOSTEL, *Architect*

By ARTHUR T. NORTH

IN a clearing, atop a range of low, thickly-wooded hills traversed by deep ravines, is located the remarkable group of buildings which are the commencement of a great university. These buildings are notable in several particulars; the use of a well-known material in a new manner, an unusual color scheme, an honest designing which is the true basis of architectural expression. These simple, exquisitely colored buildings along the borders of the forest begirt clearing, are as iridescent opals deep in a green jewel casket.

With limited means at his disposal, Mr. Hornbostel sought every opportunity to render the maximum service and to accomplish this he made a study of the local materials that were available. Georgia Marble, as marbles are ordinarily used, is relatively an expensive structural material. Visiting the large quarries near Atlanta he noted the large amount of offal, the first sawing of the rough blocks. This material had one plane face, the back being uneven and the thickness varying from less than one inch to several inches. To use this waste material was the problem.

These slabs were roughly cut into square or rectangular shapes of whatever size the piece best afforded. The face was polished and the joints made square and true by grinding on carborundum wheels. The colors embraced almost every shade of gray, pink and brown confined to one piece—or several colors common to one piece. The majority of the pieces, however, have a dominant color. The pieces were placed in the wall in random range without reference to size or color with exceptions as later explained.

The exterior walls of the building are made of concrete faced with marble. Against the outer form

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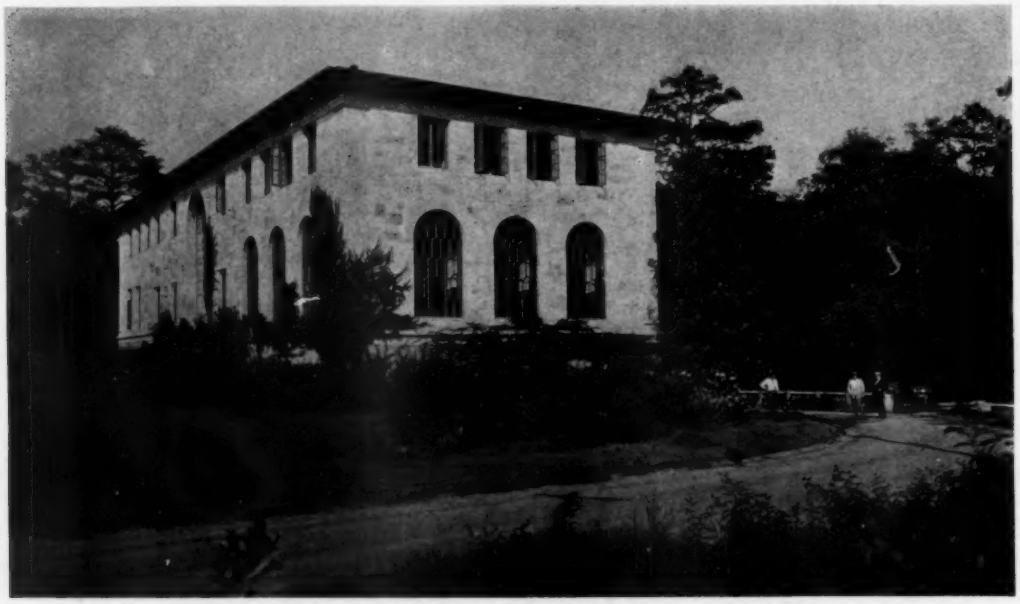
the pieces of marble were placed in position and the joints merely closed with the least possible amount of plaster of Paris. The mortar in these joints is not apparent. With wire anchors, as in marble wainscoting, the pieces are attached to the concrete which was poured into the forms after the marble facing was in position.

The marble work obviously indicates its purpose as a veneer or facing and not as having structural functions. The impression is gained by the absence of the usual mortar joints. The window and door jambs consist of slabs showing an even edge of perhaps two inches. These are made of long slabs while the soffits of the arches are formed of narrow slabs.



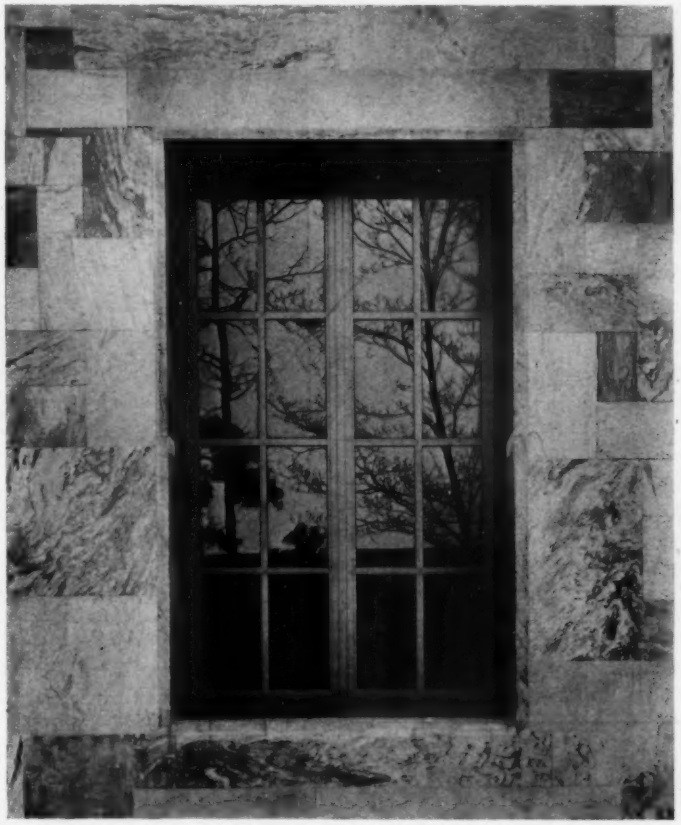
THE LAW BUILDING

In the academic buildings, Law and Theology, and the Dodds Dormitory, the corners are finished with a pilaster effect made of large slabs. These slabs are placed with vertical grain, with a slight projection beyond the face of the wall and finished with a simple moulded cap and base. They are selected for a fairly uniform color of dark reddish shade. A heavily moulded base with plinth is placed immediately above the panelled concrete basement walls. Above this base is a panelled course with slightly projected narrow stiles and rails selected for color. The frieze, immediately above the second story windows consists of large plain slabs selected for a fairly uniform dark color corresponding with the corner pilasters. The field of the wall is laid up of square and rectangular pieces without regard to color or size. As the jointing was not laid out on the drawings but made as the circumstances determined during construction, it is this unordered arrangement in size and color that gives the great beauty and charm to these buildings. A band of ornamental glazed terra cotta is in the center of the jambs and soffit of the great arched entrances. This band is pierced on each side at the spring of the arch by a window opening into the second floor toilet rooms. The ornamentation is subdued and harmonious with the cotton flower and leaf and boll as the motif. The windows are made with metal frames, sash and muntins and the division of the glass varies with the different buildings.

The chapel in the Theology Building has a wooden wainscoting, ceiling and trusses made of California Red Wood unfinished. These trusses are especially beautiful in design and when the ultimate scheme of bright spots of color is applied they will tend to lighten up the ceiling and present an appearance of richness and subdued brilliance. The walls above the wainscoting are faced with marble in a manner similar to the exterior walls. The electric lights are placed on chased bronze brackets in front of which are very thin slabs of marble in bronze frames and with bronze ornaments applied to the face. This provides a very attractive and effective indirect artificial lighting. The organ loft is treated with a very graceful and effective colonnade in plaster. Contrary to the usual custom, the chapel windows

are glazed with plate glass. No ornamental glass in colors can excel the exquisite beauty of the pine trees to be seen outside—as effective as a Japanese landscape. The beauty of these buildings is increased by the reflection of the surrounding forest and the vistas seen through and beyond the plate glass windows.

The dissimilarity of the fenestration on the principal elevations will not be apparent when the covered colonnade is constructed as shown in the drawing. The transverse colonnade in front of the central library building will house in its attic the bookstacks and be accessible to the main library building and the adjoining buildings at either end.



A WINDOW DETAIL

The Physiology and Anatomy Buildings of the medical group are treated in a different manner. The walls are constructed similar to those already described except that the corners are finished with large quoin slabs instead of pilasters. These quoins are irregular in size and selected for fairly uniform color and shade. There is no moulded base course as in the academic group but instead a plain projecting belt course with the courses of uniform height below and between it and the panelled concrete basement walls. The ends are treated with very low relief pilasters, with cap, base and frieze. Between these is placed a name panel ornamented with inscriptions. These buildings are exceedingly simple in design and inexpensive but withal presenting an attractive and satisfactory appearance.

The main buildings of the Dobbs Dormitory are connected by an arched passage behind which is a large, light and attractive common lounge room. Back of the building and at a lower level are tennis courts.

The broadly projecting cornices are built with great simplicity and are exceedingly effective in appearance. In the Academic Group the cornice is supported on a framework of structural steel. Supported on the ends of the steel lookouts or brackets is an angle iron carried entirely around the building, with the upstanding leg exposed. To the steel lookouts are suspended cream colored terra cotta brackets having a broad soffit and with but slight projection below the main soffit of the cornice. At the intersection of the dark colored marble frieze and the soffit of the cornice there is a cream colored terra cotta bed mould, into which the end of the terra cotta brackets member. In what might be termed this terra cotta frame is placed a large slab of marble, which forms the panel of the soffit. It is selected for color and in combination with the beautifully moulded, light colored terra cotta, the rich marble frieze, the dark colored angle at the eaves, the red tile roof and delicately colored and skillfully arranged marbles of the walls, the effect is so entirely good and satisfactory as to be beyond criticism.

The cornices of the Medical Group are constructed with broad concrete lookouts having a slight drop below the plane of the cornice soffit. Between the lookouts are placed large panels of marble, as in the Academic Group. This design is much more simple and almost devoid of ornament, but in keeping with the buildings. The concrete lookouts are constructed as cantilevers from the exterior walls of the building. The construction of a cornice of this type is comparatively inexpensive and very effective.

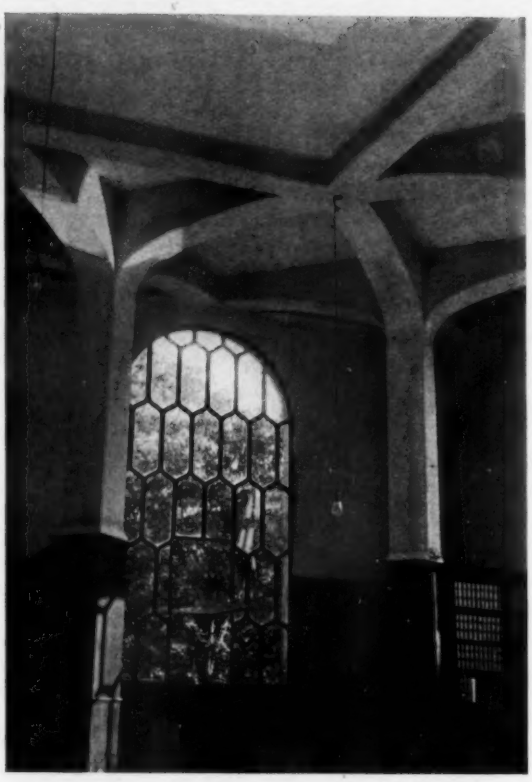
The columns supporting the ceiling and second floor over the library rooms in the Law and Theolo-

gy buildings are placed well toward the corners of the room, as shown in the illustration of the library. This column arrangement permits of a large unobstructed space in the center of the room. There are diagonal girders from the columns to the corners of the room and similar girders at right angles to these connecting columns. The soffits of the girders are arched and the effect is that of a slightly groined ceiling on a flat plane surface. Between these arched girders and enclosing the large central area are concrete girders of rectangular sections. This is a very good construction from a structural viewpoint. The peculiar column arrangement and the design and disposition of the girders give a spacious appearance to this room that could not be secured by any other means.

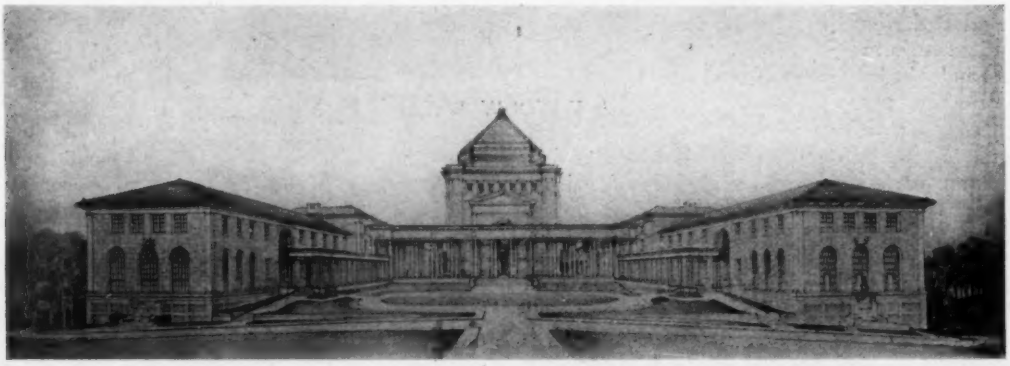
The roofs are covered with red burned-clay shingle tile not selected for shade. They are very effective in combination with the marble walls and the surrounding forest.

The complete plant will consist of the academic group in the front center of the bird's eye view, the theology and law buildings are already constructed at the left and right front respectively; the physics building at the left of the central library building is also constructed as well as the basement of the chemistry building. To the left center is the dormitory group with athletic field and gymnasium adjoining. The rear center and left constitute the medical college and hospital groups. To the right center is the domestic service group. The power house is located in the center of the plant. Roadways are constructed with concrete bridges over the ravines and ornamental concrete balustrates along the edges of the ravines—as shown in the rear of the law building.

Great credit is due to that master mind and skilled hand which has found a use for a waste product —a use that has resulted in buildings of incomparable beauty. It requires a certain measure of bravery on the part of the architect to make such a radical departure from the traditional methods and designs applied to such an important project. Happily, success attended the effort and there stands a group of buildings well worthy of the attention of all students of American architecture.



INTERIOR OF LAW LIBRARY



ACADEMIC BUILDINGS

Theology Buildings at left, Law at right, Library in center. Book stacks are located over the transverse colonnade and accessible from buildings at each end.

Architectural Quicksands

The Checking of Estimates

By CLINTON H. BLAKE, JR.

WHILE treating of this subject of superintendence I should say a word of the extreme importance of another phase of the architect's duties as the representative of the owner in building operation. In a sense, it is not a part of his duty as supervising architect, and still, in a broader and perhaps truer sense, it is. I refer to the proper checking of certificates and statements of materials used and work done. Manifestly, there is no phase of the whole building operation which more directly and vitally affects the pocketbook of the owner, and yet it is, I am afraid, often true that, in many instances, the architect gives inadequate thought and attention to this phase of his work. Many an architect will be inclined to treat it as a purely routine matter, and to accept the statements submitted by the contractor, prepare his certificates on the basis thereof, and issue them, without adequate auditing or appreciation of the importance of the step taken. There has recently been a very refreshing change in this respect, and a much more general appreciation of the importance of a more business-like administration of this part of the architect's duties. Mr. Higgins, in the articles to which I have already referred, has treated the subject admirably and driven home the importance of the point which I have in mind.

It has recently been impressed upon me anew, by a case in which I have represented the architect, and in which, if it had not been for the vigilance of the latter, the business-like organization of his office and his insistence upon having all details as to materials and work checked and in proper form, before authorizing payments to the contractor, the owner would have suffered a loss of a very large amount. In the case which I have in mind the architect had endeavored to guard against all contingencies, and yet, much of the trouble, to which he was put to defeat the unjust claims which the contractor in that case made, could have been avoided if the contract had been in a slightly different form. The contract set forth estimates of the various component parts of the work and provided payments to the contractor of specified sums for each component part, such as excavation, masonry, and the like. This left it open to the contractor to lump his largest charges on the earlier items, viz.: the iems for which the early payments were to be made. In fact, we found that he apparently had done this very thing, and that he had added practically all of his prospective profit on the job to the earlier items. The result was that if these items had been paid in full on the basis of the estimate as originally submitted, the contractor would have received in the early payments all of the profit which he expected on the entire job, and would have had little interest in the balance of the work. The architect, fortunately, realized the troublesome possibilities in the situation, and took care to analyze the estimates submitted. He insisted on the submission by the contractor of statements of quantities and prices covering each component part of the construction, as the work progressed. He checked these quantities and verified the market prices in connection with the items on which the quantities were submitted. He soon found that the contractor was about to secure all of his profit and overhead on the first few items for which he had submitted statements. He immediately took up the matter with such good effect that he was able to hold out a sufficient sum to safeguard the owner, and to compel the contractor to complete the work, eventually, without loss to the client. It is evident that if the contractor sees that he can secure all of his profits and overhead on the component parts on the earlier items, due to the fact that these are in excess of the true valuation of the work which they represent, his interest in the remaining items involved in the work is small. In fact, in the case to which I have just referred, the contractor, when the job was substantially completed, went into bankruptcy. If the architect had not acted as promptly and as vigorously as he did, the owner would have been left with a half-finished work on his hands, all of the contractor's profits would have been paid to him, and the owner would have been faced with the necessity of completing the work with less money in hand for this purpose than would suffice to pay the sub-contractors and materialmen, and finish the details left uncompleted by the main contractor.

When, following the selection of the architect and contractor, the latter is asked by the architect to submit an estimate of the cost of construction of the component parts of the building, such as excavation, masonry, timber work, trim and the like, the contractor, in submitting this estimate, will almost

invariably be found to submit it in lump sum items, without giving quantities and prices. If one stops to think, and analyzes the legal and practical effect of handling the matter in this way and of accepting estimates so submitted, without additional safeguards on details, the danger of such a proceeding will be obvious. To eliminate the element of uncertainty and risk, the architect should insist on the submission of quantities and prices on each item and component part. He should then take the quantities and investigate and verify the current market prices on each of the items on which the respective quantity estimates are submitted. He should then make sure that a proper agreement is made with the contractor under which the latter will be called upon to submit each month, with his application for payment, a similar list of quantities and prices. The matter of extras must, of course, be considered and the agreement should provide for additional quantities made necessary by extra work, on the basis of the quantities and prices originally approved and accepted. Payments are then made on the basis of the agreed quantities and prices, as installed in the building and approved by the architect. As a phase of operation, a more detailed explanation of the approval would come from the general superintendent, and, if a clerk of the works be employed, his report and approval would be secured in the first instance. By following this plan the contractor will be paid for the true value of the work done, the reasonableness and accuracy of the quantities and prices will be duly checked and known, and the danger of the contractor securing all of his profit and overhead on the earlier items will be eliminated.

Danger of Allowing Owner to Authorize Extras Direct.

It seems self-evident that if the architect be intrusted with the duty of supervising the construction of the building, all orders to the contractor, involving additions to or modifications of the contract, should be submitted through the architect. I have already touched upon the danger of the architect authorizing any extras or changes without the definite and clear approval of the owner. It is very nearly as important that where the owner desires changes made he should communicate his wish to the architect and not direct to the builder. Where the latter course is followed confusion must invariably result.

I have had before me, during the last few months, a case in which a very unpleasant situation was created, and a great deal of misunderstanding caused, by the owner giving orders to the contractor direct. He did not do this because of any conscious desire to slight the architect, but because he did not realize probably the effect of handling the job in this way. Impatient to secure quick results, changing every few days in his decision as to details of construction and the like, and meeting the builder at the job, in the absence of the architect, he would issue instructions to the former for changes in construction, plumbing, decorating and similar items, without troubling to communicate them through the architect, or even to advise the architect promptly of the instructions so given. The inevitable result ensued. The owner, in changing some item, which he regarded as a minor matter involving small expense, and without the prior knowledge of the architect, would make necessary other changes, the aggregate expense of which would be considerable. In directing that an electric outlet be changed from one side of the room to another, he would not consider that, in order to do this, the floor or ceiling work might have to be changed, or that in cutting out an alcove or doorway, steel or timber construction would be required to bear the weight which the alcove partition or doorway had formerly supported. The builder was somewhat at fault, in that he did not, apparently, make as clear to the owner as he should have the effect and cause of the various changes. Be that as it may, the result was that, after the owner had proceeded thus for a number of months, he received a bill from the builder which showed a tremendous increase in the original estimated cost. He at once refused to make payment of the bill, and descended upon the architect, with an evident intention and desire to hold him responsible for the adjustment of the situation. The architect had sensed the danger of the situation some time before, when he learned of the course which the owner was following, and had unsuccessfully tried to point out to the latter the foolishness of the method which he had adopted, and the result which must surely follow. He had pointed out, also, that it was not fair to him that the work should be handled as it was being handled; that changes might be made which would result in architectural work which he would not care to have pointed out as the work of his office; and that his responsibility as supervising architect should not extend to work which he did not authorize, or to changes made and work done without his knowledge or approval.

This particular case was aggravated by the fact that the architect had agreed with the owner on a definite charge for his services. When he agreed to this he of course expected that the work would proceed, as originally planned, and did not count upon the repeated modifications, additions and extras decided upon by the owner. The owner, to cap the climax, took the position that, while he would not pay the architect a cent more than the amount originally agreed upon, or allow him any commission

on the added cost of the work, made necessary by the orders given by the owner to the contractor, yet he would hold him responsible as supervising architect for the proper construction of the entire job, including both the work originally laid out by the architect and the items authorized by the owner during the progress of the construction.

As a legal proposition, the owner could probably not sustain any such inconsistent claim as this position would involve. As a practical matter, however, the architect was faced with the alternative of retiring from the job, to avoid possible responsibility for work which he did not approve, or of continuing with the work, making the best of a bad situation and endeavoring to make the owner see reason. It was also clear that if he did not continue the contractor would probably not receive payment for the work done. While this might be just retribution for the failure for the contractor to insist that orders should be given to him through the architect, and for his failure to report to the architect the orders given to him direct, yet the architect did not feel that he could withdraw without an effort to secure an adjustment which should be reasonably fair to the contractor. He accordingly chose to continue on the job and succeeded in arranging a proper settlement between the owner and the contractor. The owner refused, however, to pay him any commission beyond the amount originally specified and the final result was that the amount which he received was about one-third of the value of the services which he rendered. If it had been more clearly and definitely agreed that the owner should not follow the course which he did, and if the architect, when the tendency of the owner to handle things direct had become manifest, had insisted either that the practice be discontinued, or that he be allowed to withdraw, the difficulty would have been avoided, the architect would have saved many hours of time for which he never received remuneration, and much of the unpleasantness which developed between him and the client would never have arisen.

Chicago to Build Big "Health Center"

An institution which in the last thirty-four years has ministered to more than a million patients among the city's poor and whose laboratories and clinics have been of untold value to the medical profession of Chicago and the world at large is the Chicago Polyclinic and Hospital, which on November 8 will inaugurate a drive for $1,000,000 to enable its supporters to erect a modern hospital and "health center." The original buildings, long since inadequate for the service of the rapidly growing city, were erected and supported by a group of leading physicians and surgeons who felt the need of such a clinic and such a hospital. The public has never before been asked to contribute to this praiseworthy effort but its importance in the community is vital and far-reaching.

The "health center," with its popular lectures on sanitation, nutrition and other important health topics is unique in civic annals and it is the purpose of the polyclinic to make it a model for other cities of the United States. Not only will the public be taught how to keep well, but a dispensary or "out patients' department," a diagnostic clinic, where leading specialtists will examine and recommend, laboratory tests and examinations, and other allied activities among the features. All branches of medicine will be represented and clinics will be open daily and available to all.

The care and reconstruction of men injured in industries will be also considered in the new polyclinic. Special effort has been made to design a building which will be sanitary and comfortable for the patients and staff. Noise has been practically eliminated by isolating the birth rooms, pantries, kitchens, laundries, power plants and other places where there might be commotion to annoy the patients. All signals are to be the silent light type. There will be solariums and roof gardens with special play rooms for children and gymnasiums for corrective exercises. Closed stair cases and elevators opening into noise-proof vestibules will add to the general quiet as well as preventing hospital odors from circulating from floor to floor.

In the group contemplated will be the out department, an educational department, a complete hospital, a training school and home for nurses and a social service department.

The drive is directed by Mrs. Mary F. Korn, and headquarters in the LaSalle Hotel, Chicago.

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The Early History of Gas in New York

ON the northeast corner of Elizabeth and Hester Streets it was that one of the original offices of a gas company in New York City was located, the headquarters of the New York Gas Light Company, writes Robert E. Livingston, in the New York *Evening Post*. The brick building that has been used all these years as a gas office was originally, and for forty-one years of the last century, New York's leading Quaker church.

This building, it is expected, will soon be demollished, and the site will be used for a substantial building that will afford better accommodations for the immense business that is done in that office by the Consolidated Gas Company. The site is a valuable corner and the buildings that now stand have always been kept in excellent condition. The plot covers 100 feet on Hester Street and 150 feet on Elizabeth Street. This gas office is the headquarters for all gas consumers below Fourteenth Street. With the exception of a new front on Hester Street, the quaint, low, red brick building, with its peaked roof, exists to-day almost exactly as it did when it was the sanctuary of the Society of Friends. It still preserves much of the atmosphere of peace and quiet that hovered about it in its early youth, notwithstanding it is one of the busiest gas offices in the world.

Just how it came about that the old New York Gas Light Company succeeded the Society of Friends in the occupancy of the old church edifice when the Society members moved uptown is not altogether clear. It is thought probable that William Fox, a prominent Quaker, who in the sixties was president of the New York Gas Light Company, and other prominent Quakers who were active in the affairs of the gas company, had much to do with the transfer.

The church was built in 1819. The old high stone steps up which the Quakers climbed to attend meeting are still in use. The original cobblestone court is still in the rear of the building where one of the gas company's emergency crews is housed, and ready for call day or night. The interior of the building still reminds one of the old-time Quaker "meeting-house" and there is still there a curious narrow iron railing gallery running completely around three sides of the large open room, the ceiling of which is the roof of the building. Remove the decks and a partition or two and one would have restored the original appearance of the place.

The small brick building in the rear facing on the court, now occupied by the handsome red emergency automobile and its crew of five men, was originally occupied by the Quaker school. Just in the rear of the church there was for many years an old Quaker burial ground. When the Society of Friends moved up to Stuyvesant Square the bodies of the departed Quakers were reburied in a new cemetery in Brooklyn.

It is ninety-six years ago that the first gas company in this city received its charter. It was the New York Gas Light Company and it was established "for the purpose of better lighting the said city and the buildings, manufactories and houses therein." This pioneer gas corporation was given the right "to manufacture, make and sell gas, to be made of coal, oil, tar, peat, pitch or turpentine or other materials."

The romance of the introduction of this commodity with which we are now so accustomed to do lighting, heating and cooking, and which now has such a tremendous use for industrial purposes, is set forth as follows:

There were 17,000 houses in the city in 1822 when a group of men put their heads together and decided that gas could be made and sold. In those days New York lived down around Battery Park and in Franklin Square. The first gas works were built in Centre Street, not far from the Tombs. The city's population was 150,000. Samuel Leggett, a Quaker, was the first president. He lived at No. 7 Cherry Street, his house with others giving way for the building of the Manhattan pier of the Brooklyn Bridge. John Hancock lived at No. 5 Cherry Street, and at No. 1 Cherry Street George Washington had lived as President of the United States. Samuel Leggett was only forty-one years old when he decided to set an example to the citizens of his country at large by illuminating his private residence with the new illuminant—gas.

The press account read:

"The exhibition of gas lights last evening at 286 Water Street attracted a great number of ladies and gentlemen, notwithstanding the unfavorable state of the weather; it will be repeated again *this evening*. Six new burners have been added, which rendered the display considerably more brilliant than that of the preceding occasion. It has been suggested that it would be more gratifying to our citizens to have the apparatus removed to a more central situation than where it is at present. We think either the City Hall, or Washington Hall, would be more eligible."

It was from the small beginning, as sketched here, that this enormous organization as it exists to-day came into existence. To-day there are 1800 miles of gas mains under the streets of Manhattan

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and the Bronx and thousands of miles of service pipes connecting the mains with the buildings in our avenues and streets. More than 900,000 gas meters are in use in those two boroughs. At the works of the Astora Light, Heat and Power Company, Astoria, L. I., stands a gas holder with a capacity of 15,000,000 cubic feet of gas, the largest in the world. Gas mains connecting with the Bronx are six feet in diameter, also the largest in the world. The plants of the Consolidated Gas Company have provided the world record daily output of gas—160,327,000 cubic feet.

Ecclesiastical Metal Work of Ireland

By W. H. McGinty, *Architect*

IN their metal work as in the high crosses, manuscripts and other designs of the ancient Irish artisans there is found a well developed and perfected Irish style.

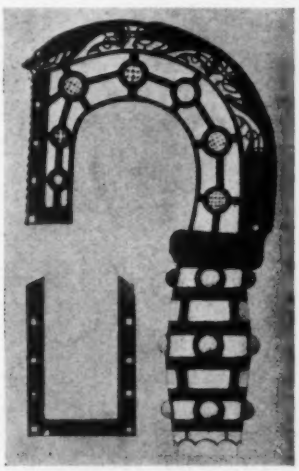
Writing of the Irish churches and oratories, Ferguson in his History of Architecture states that the style is as interesting, in itself, as that of any local minor style found in any part of the world. In addition he makes the flat statement "That without the

THE ARDAGH CHALICE

intervention of the Celt we should not have possessed a picture or statue that we could look at without shame." And again "The Celt makes the best of colorists and where his influence was strongest there architecture was the most perfect; as his influence faded or as the Aryan prevailed the arts first languished and then died. It is safe to assert that where no Celtic blood exists there no real art is found."

In metal work of this period of ancient Irish art there now are in the museums of Ireland and Scotland and in the British Museum in London the finest specimens of work in bells, croziers, processional crosses, bell shrines, book shrines, brooches and pins.

One great peculiarity of this ornamental metal work is the slight intrinsic value of the materials entering into its manufacture, copper and bronze and other inexpensive materials composing these precious relics. Their great value, however, is attained by the wonderful skilled workmanship displayed in their creation. It is generally accepted as a fact that intrinsic value of materials enter into a work only when artistic talent is at a low ebb. As in the making of a fine violin the cost of wood is not considered, so in the works of art in Ireland at this period when designing the beautiful chalices and



THE DEVONSHIRE CROZIER

croziers, they were enriched by the skill of the most patient and careful workmanship, and not made of materials valuable because of their scarcity.

It seems quite safe to assert that the art which

culminated in such a design as the Ardagh Chalice must have been practiced many years in order to reach such a high degree of perfection. That these intricate and interesting articles were designed and manufactured in Ireland from fourth to the eleventh centuries of the Christian era is well established. Whether or not the art originated in Christian Ireland or in Pagan times, as some writers state, is needless to discuss here.

THE ARDAGH CHALICE

This artistic and wonderful design is only nine and one-half inches high and seven and one-half in diameter. It is, however, made up of more than three hundred and fifty different parts. Like other metal work of the time it was made of gold, silver, lead enamel, glass, amber and mica.

This chalice belongs to a well recognized class of early metal work in use in the Irish church before the tenth century. It is made principally of an alloy stated as three parts silver to one of copper. The ornamentation cut into the bowl, consists of an inscription, interlaced patterns terminating in dog's heads and at the bottom of the bowl a circular band of a Greek pattern. The ornamentation seems to have been made with a chisel and hammer. The band encircling the cup is composed of two semi-cylindrical rings of silver ornamented with small punched dots. Between the rings the space is filled by twelve plaques of gold repousee ground work and is ornamented by fine wire filigree wrought on the front of the repousee ground work. This is of the interlace pattern always found in Irish art.

An analysis of the enameling of this work discovers that there are three distinct kinds, each difficult and interesting. Color enters largely into the beauty of the design as it does into all similar work in Ireland.

THE CROSS OF CONG—
BRONZE, SILVER AND GOLD, JEWELED

Engraved on the exterior of the chalice are the names of the twelve Apostles in which the form of the letters conforms with those in the Book of Kells.

This chalice is a masterpiece of the artistic metal work of Ireland at its best period. Designers of any age or period in any part of the world have not been able to surpass its high standard.

THE CROSS OF CONG

With the exception of one discovered at Monaghan a few years ago, the Cross of Cong is the only processional cross of the Celtic style now in existence. It was originally made for the church at Tuam and was intended to enshrine a portion of the True Cross as stated in the "Annals" of Innisfail A. D. 1123.

The core of the cross is of oak, covered with copper plates, on which is the decoration of richly designed tracery interwoven. Concealed at the time of the Reformation, it was found early in the nineteenth century by the parish priest of Cong.

In height it is two and one-half feet and a trifle more than one and one-half feet across the arms. The outer margin is formed by a roll moulding and inside the moulding the space is divided into panels decorated by enameling in relief. There are eight panels surrounding a center of rock crystal at the crossing of the arms. Thirty-eight other panels in the arms and shaft are all decorated in gold filigree work.

The entire design is remarkable in its beauty, showing a very high artistic development.

THE MONAGHAN CROSS

There was recently discovered at Belfast, Ireland, another example of ancient Irish art in the shape of a bronze processional crucifix dating from the eleventh century and almost perfect. This cross

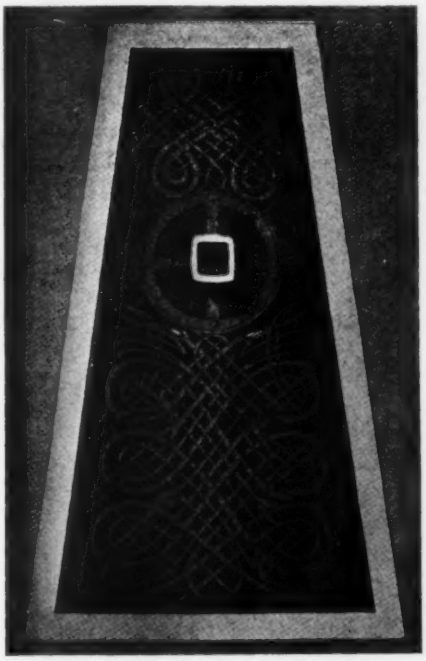
which is twelve inches high has at the head and arms enlarged terminals each of which was jewelled and ornamented in the ancient Irish way with silver and precious stones. The sacred figure while much worn, is perfectly modeled.

A most unusual feature is the addition of large beads on each arm and at the base, skillfully fastened through the cross with bronze pins after the style of the Cross of Cong. A large bulb terminating in a serpent's head forms the base. This bulb

THE SHRINE OF ST. PATRICK'S BELL—SILVER, JEWELED

is elaborately interlaced, the four intersecting crosses having specimens of the marbles of the four provinces of Ireland. The center of the staff has a raised bronze band with Celtic ornaments from the design of the Ardagh chalice. It bears in simple Galic a suitable inscription.

St. Patrick's Bell is an example of the early Irish work in metal, and is known as the oldest authentic Irish Christian relic in that material in the Royal



ST. PATRICK'S BELL SHRINE

Irish Academy. It is a square iron bell lined with bronze, and is formed of two sheets of metal, one bent over to meet the other and riveted together.

It is about six inches high, four and three-quarters by one and one-half in width at top and four by five inches at mouth. The outer case, eleven inches high is an exceedingly rich example of art work. On a ground of brass fine filigree of gold and silver applied in curves, interlacings and knots.

On the back of the case or shrine is an inscription in most decorative lettering. This shrine is of copper and originally was covered with gold and silver. In many interlacings, especially on the side there are many intricate patterns of serpents. The beauty of the entire design is of the highest order.

Salvage from Old Buildings on New Plane

With building materials continuing at a high level, and the demand for houses greater than ever before in history, calls for material are constantly being made upon the wreckers of old buildings, and instead of yards being piled high with goods, as was once the case, old brick, second-hand lumber and other materials that enter into home-building are eagerly sought.

There are many peculiar angles to the wrecking and salvage of materials in old homes and other buildings, and contrary to the common belief that handsomely finished buildings with fine interiors are the best for the wrecker, they would rather have plain buildings of ordinary structure to wreck.

"There is always a sale for old material of any nature," said the manager of a large Cincinnati wrecking company. "If you have a place to store it somebody will come along and buy it for some purpose. The only thing is in the waiting.

"Times have changed in the wrecking and salvage of materials," he said. "Some of the things that had a ready sale a quarter of a century ago now are the hardest to get rid of. Take the fine marble mantels that we get out of some of the old homes that have outlived their usefulness. A person would think that they would find a ready sale, but there is no call for them. People today want wood mantels. Unless they are perfect it is hardly worth the trouble to attempt to sell them. Iron mantels that were the rage twenty-five years ago find no market, and are worth almost as much as junk as they are offered for private sale.

"There is a constant demand for brick and lumber, doors and door frames, windows and window frames, and these we sell as fast as we get them. All that is needed is a little care in taking them out of a building and they can be used over again. Iron pipe also finds a ready market, but we junk most of the lead pipe, as plumbers are reluctant to use second-hand lead pipe. It is worth almost as much as junk, so little is lost on it.

"Finely finished interiors have little attraction for the wrecker. Unless extreme care is used the woodwork will be marred and it does not find a ready sale. Some people ask, as a matter of sentiment, that some particular part of a home be saved when we take over a house, but this is infrequent.

"Where does the majority of the salvaged goods go? Well, the best answer to that is 'to the four winds.' The brick and lumber is used largely here in Cincinnati, being bought by contractors. Then the country people come in and ask for certain things they would like to obtain. I would say that we send things to points within a radius of fifty miles of the city, but it would not pay to ship it any further than that."

Many interesting things are to be seen in the storerooms of the World's Fair Wrecking Company at Gest street and Mill Creek. Chandeliers, from the massive size that once graced Cincinnati's finest homes to the two-burner size, can be found and an occasional seeker after chandeliers of a certain type helps to keep the supply limited.

Fancy tile and roofing slate are also things that find an occasional buyer, but unless they are in good condition these materials are not as a rule saved.

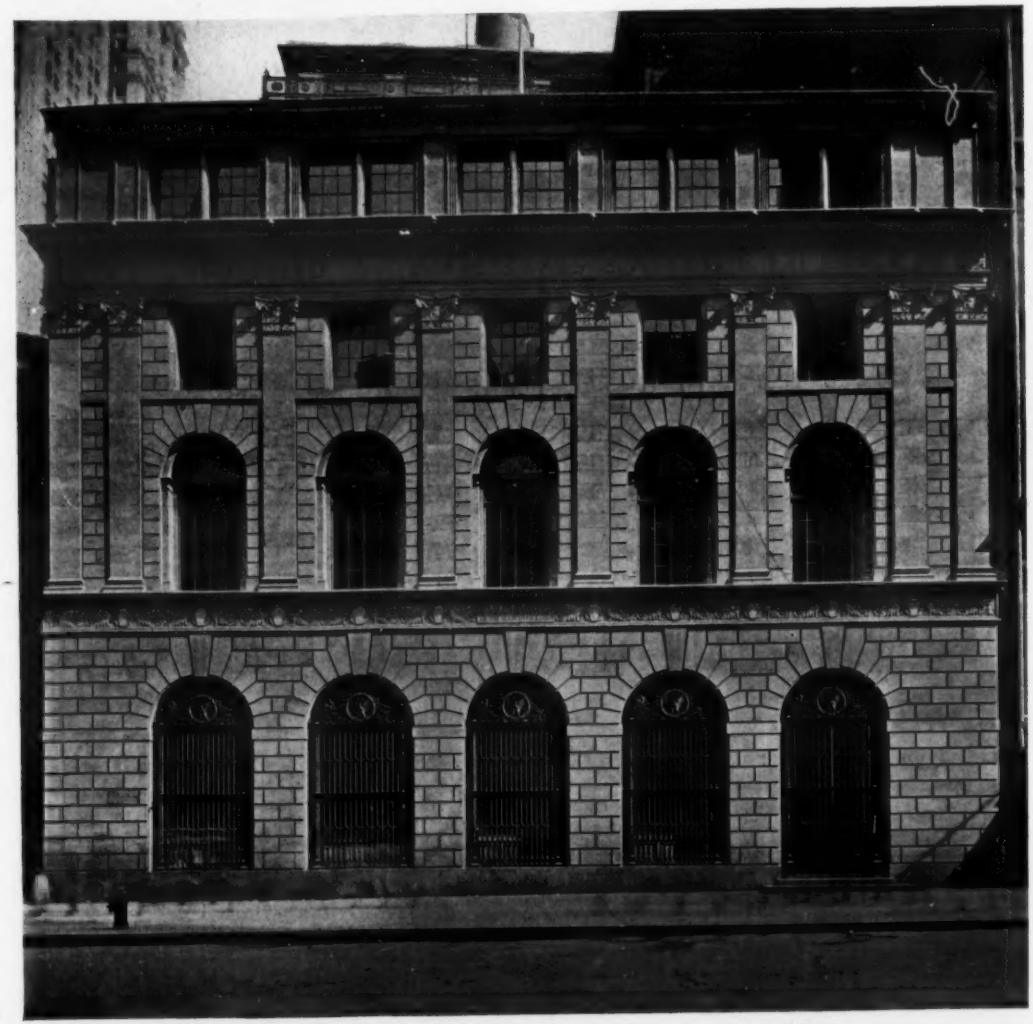
French Property Damaged by War

The completion of the estimates of losses caused by the war now makes it possible to state the number of little villages, farms, and real estate holdings which were partly or wholly destroyed in France. These final estimates, prepared for the use of minister delegates to forthcoming allied conferences, show that 1,659 towns and villages were totally wiped out by war's ravages.

Some of the more interesting returns of these official figures, which have been obtained by the French Section of the Foreign Information Service of the Bankers Trust Company, are as follows:

Number of towns and villages injured:	
In the six departments which were invaded	4.022
In the department of Seine, Seine-et-Oise, Seine-et-Marne, Seine-Inferieure	173
Number of towns and villages in which destruction reached	
100 per cent	1,659
50 to 100 per cent	707
Less than 50 per cent	1,656
Number of real estate holdings:	
Entirely destroyed	290,300
Partially destroyed	269,870
Number of private wells damaged or destroyed	62,900
Number of cubic meters of earth to be moved to restore property	42,100,000

As an indication of the progress made in restoring these losses, the official figures show that nearly all the injured towns and villages (4,006) have been re-established and 134,000,000 cubic meters of trenches have been filled up.



UNITED STATES ASSAY OFFICE, WALL STREET, NEW YORK

VIEW SHOWING THE RESULT OF BOMB EXPLOSION

YORK & SAWYER, *ARCHITECTS*

St. George's Church, Hempstead, Long Island, New York

(See reproduction of the original drawing by O. R. Eggers in this issue)

WHO designed and built this church is not of record. It is one of the few remaining two-story meeting houses that stand a relic of that past when our forefathers either had or took the time formally to express the religion that so dominated their daily lives.

Like the old church at Lyme, designed originally, it is claimed, by Sir Christopher Wren, and made famous by the brush of Childe Hassam, this Long Island church stands as a solemn reminder of a day when the church was interwoven into not only the religious but the social activities of communities. Its quaint churchyard, where "each in his narrow bed forever laid, the rude forefathers of the hamlet sleep," forms a sacred enclosure in which there has been reared this church.

Its square tower and clock with the latticed windowed cupola suggests those types erected when the dweller on the shore of Long Island Sound and our New England coast was either seafaring or intimately connected with our then important shipping industry. From these cupolas or the balconies that often surrounded them, anxious eyes peered out to sea to mark, if they might, the familiar sail of some long overdue ship.

The intimate relation of these country meeting houses, the fact that they not only served as places of worship but also as community centers, caused them to be regarded with deep reverence and enabled them to receive all the affectionate care that it was possible to give to their design, planning and maintenance. For the small community we might with profit more often look back to this earlier type.

ST. GEORGE'S CHURCH, HEMPSTEAD, L. I.
THE AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

Utilizing a By-Product

IT is a tradition among architects that the present development of textured brick was the result of a resort to the "cull pile" at a brick yard to find enough additional brick to tide over an urgent need. When these had been set into the wall the result was so very satisfactory, so very artistic, that a new idea in brick was evolved. The up-to-that-time standard "Philadelphia pressed brick" at once lost its prominent position and brick makers, active with architects, set about the production of textured brick. The result has been most successful and much of the color present in the architecture of our city streets is due to this simple incident where the "cull pile" was made the source of an artistic result.

It is unfortunate that we are unable to reproduce in color the wonderful tones of the buildings of the Emory University, illustrated in this issue. Mr. Hornbostel has by the use of what was practically a rejected material obtained a result which, like all really good artistic things, does not entirely depend upon the costliness of material used to produce a good effect. Those who are familiar with the rare colored marbles quarried from the hills of Georgia, will recall the dazzling white, the cerulean blue and the richly tinted pink and red hued effects. On a huge pile, the accumulation of years, Mr. Hornbostel found the first sawing of the originally quarried blocks. Much of this rejected material possessed the qualities of rich color and fine effects of weathering that would attract the eye of an architect keenly alive to its artistic possibilities and as keenly alive to the economic value of the material. From this heterogeneous lot of rejected material, Mr. Hornbostel has constructed this important group of buildings. The result may not be adequately described. It must be seen to appreciate the most wonderful effect that has been secured.

IT is "a far cry" from the state of Georgia to the roadside of England, but it is not possible to refrain from a comparison that proves a certain contention. And that contention is, that the beauty of the rural domestic architecture of England is due to the fact that it is created almost entirely from materials that are taken from the very soil itself. The stones used, the timbers and the thatch, are all from the nearby fields. The result is that the whole effect simply "belongs," it is as if the very houses had grown from the soil itself.

Now, in the case of Mr. Hornbostel's fine group, we have an almost identical result. These "culls" of marble slabs are from the very heart of Georgia, and they find a very appropriate lodgment in a group of buildings that are intended to foster the mental growth of the rising generations of that state.

We shall get nowhere in the evolvement of a national type, nor even a regional one, as long as we go so far afield for main structural material, or adhere so strictly to academically expressed motives of design. It was noted in these columns in the issues devoted to the recent convention of the Institute that so similar was the designing and detailing of buildings that were illustrated in the National Collection and exhibition of architectural work that in ignoring the "legends" of locality, no one could even make a remote guess as to the regional location of the buildings. Every state, all regions, have their flora and fauna that provide motives of design that would be a fine encouragement to a regional pride. But with one or two exceptions these were ignored, and in their place we find that same familiar acanthus, the "egg and dart" and the "reed and bead." In like manner the material employed seemed to have flowed from a common source. Mr. Hornbostel's group takes no part in this monotony. These Georgia buildings are built of a Georgia product and the very building seems to take a pride in its right to "belong," for the large surfaces of its windows reflect the graceful forms of the Georgia pines and other arboreal surroundings. We might to great advantage have more of this sort of thing, and when we have we shall be well started toward a freely developed regional type and have escaped the dead level of monotony that now seems to obsess us.

XUM

The Middle West has the Right Idea

IN sharp and most satisfactory contrast is the action of the National Building and Construction Congress in the matter of stimulation of building and particularly with reference to the housing situation, as compared with that of the New York State Legislature. On the one hand we have a group of highly trained and specialized men who know their work; on the other a political body who, as the daily papers state, have reached their conclusions and based their final action solely on party lines.

At the Contractors' Congress, opened in Chicago on Sept. 27th, the most energetic element fortunately was in the majority. An effort to postpone definite action until June 1st, when another congress would be convened, was strenuously and successfully opposed. The majority, with characteristic Western energy, demanded immediate action and fortunately for building interests in the Middle West, they got it. The result is that every possible stimulant to building activity that can be applied will be at once organized and set afoot.

E. M. Craig, secretary of the Building Construction Employers' Association of Chicago, was a most strenuous advocate of immediate action.

"Why delay eight months?" said Mr. Craig. "June is a long way off. Meanwhile the people need more houses. Let's start something. Let us stimulate building before spring building starts. We know what's the matter. Factors have been thoroughly discussed.

"The National Board of Awards is now functioning in jurisdictional disputes, which means fewer chances of structures being tied up by such disputes. We ought to tell the public this and start something that will restore public confidence. We ought to have a meeting in January instead of June to stimulate building in the spring."

It is now decided to adopt this policy of prompt action and to further this purpose local committees are to be formed in each community. All of this will tend to bring together in co-operation every element contributing to a resumption of building activity. By these methods there will result, and speedily, a promotion of efficiency and an improvement in quality in the service rendered to the building trades. But what will be of prime importance is that this efficient method, based on the necessities that confront us will early develop an understanding of interdependence within the building industry, so that each part will smoothly work with the other. The result will be the rehabilitation of the building industry, the coordination of all of its complex factors and a better all around understanding.

The Western builders have set a fine example to the entire country. The way to resume building is to resume. The energetic men in the West have shown that apathy at this time borders on a crime. Why not let this enthusiastic and practical spirit spread all over the country? When it does there will be no trouble in securing the right sort of legislation to smooth matters to a speedy and safe conclusion.

The Bomb Explosion

NEVER before in this country has it been possible to learn by practical demonstration just exactly what would be the result of the explosion by hostile act, in time of war, of a bomb in the crowded sections of any of our large cities.

The setting off of a bomb, supposed to have been filled with TNT and a large quantity of metal slugs, in the most congested spot of the financial district in New York on September 16 affords an opportunity to draw certain conclusions based on an actual experience. Undoubtedly the most important element in any attack by a bombing force is the purely psychological aspect, the destroying of the public morale, the lowering of the power of well organized resistance to an attack that cannot with any certainty be foreseen. The material destruction that would be involved bears so small a proportion to a city's area as to be hardly worth consideration.

Careful investigation of the results of the recent explosion in Wall Street would seem to justify the contention that the letting off of even so large a quantity of high explosive, merely subjects the adjoining property to slight surface damage but in no way destroys the stability of the structure. Even in the case of a bomb let off from a plane which finds its point of impact on the top of a building, it is highly improbable that the damage would extend far beyond the building attacked, and in the case of one of our more modern buildings it is reasonable to assume that damage would fall far short of demolition.

It would take many hundreds of bombs to create a condition that would seriously affect the entire city's buildings. The main result would be more largely nerve wracking and morale impairing. Close investigations by trained observers have failed to disclose damage that in the slightest degree impaired the safety of any of the structures within the affected area of the explosion. A large breakage of window glass, estimated to entail a cost of $250,000 in replacement and the scarring of buildings by flying missiles, seems to have been the sum total of the damage to the Wall Street district.

In technically reviewing this explosion, at no time is the deplorable fact of the large loss of life ignored. When, if ever, we shall trace the perpetrators of this outrage and bring them to the bar of justice, an outraged people will know how speedily to mete out punishment.

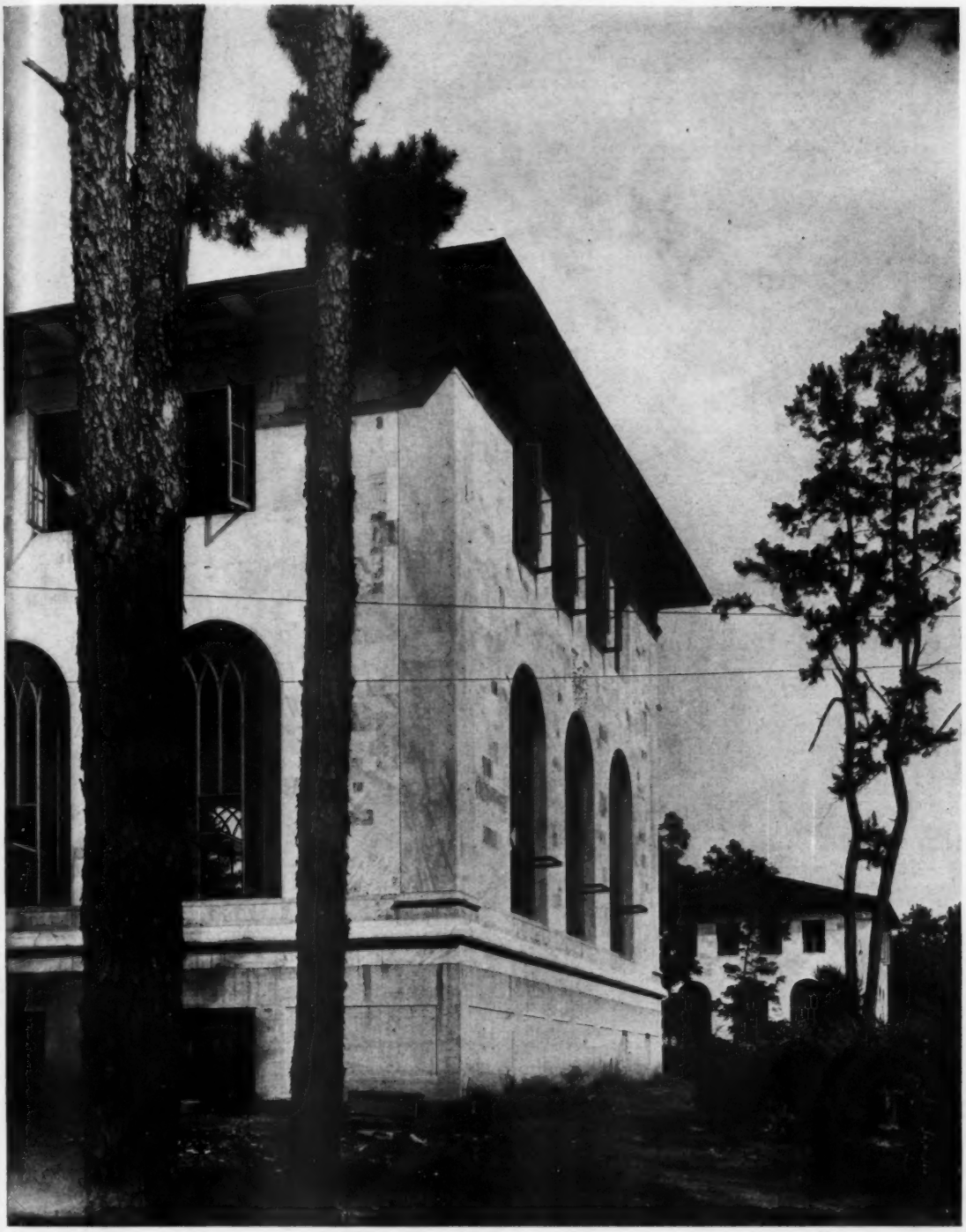
XUM

H. HORNBOSTEL, *ARCHITECT*

DORMITORY BUILDINGS

EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*



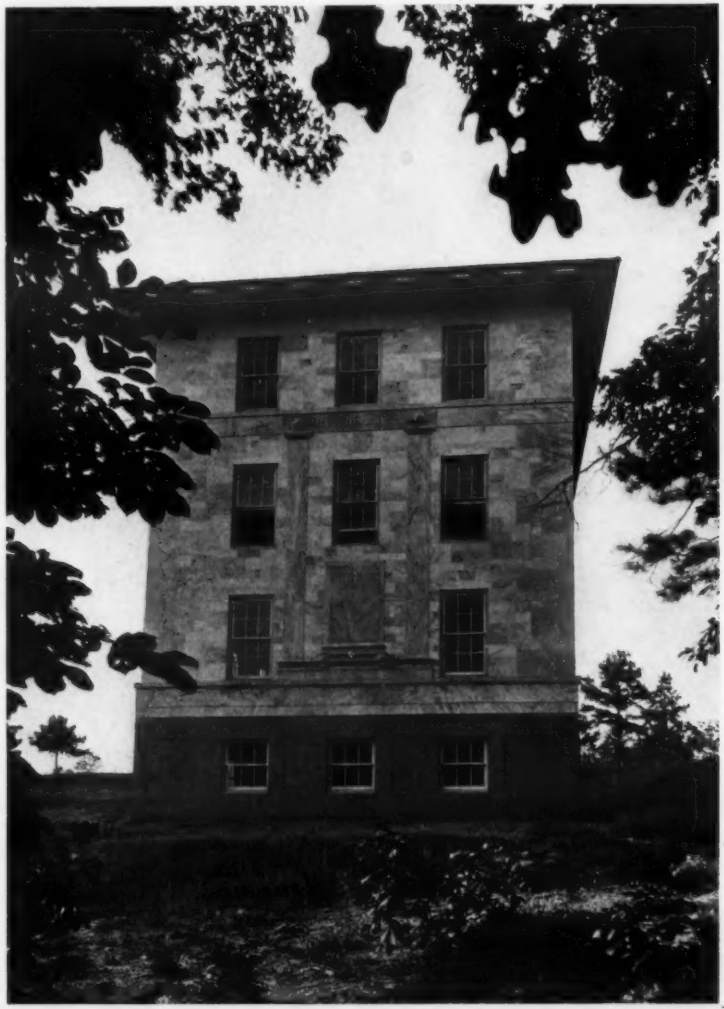
THEOLOGY BUILDING

EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*

XUM

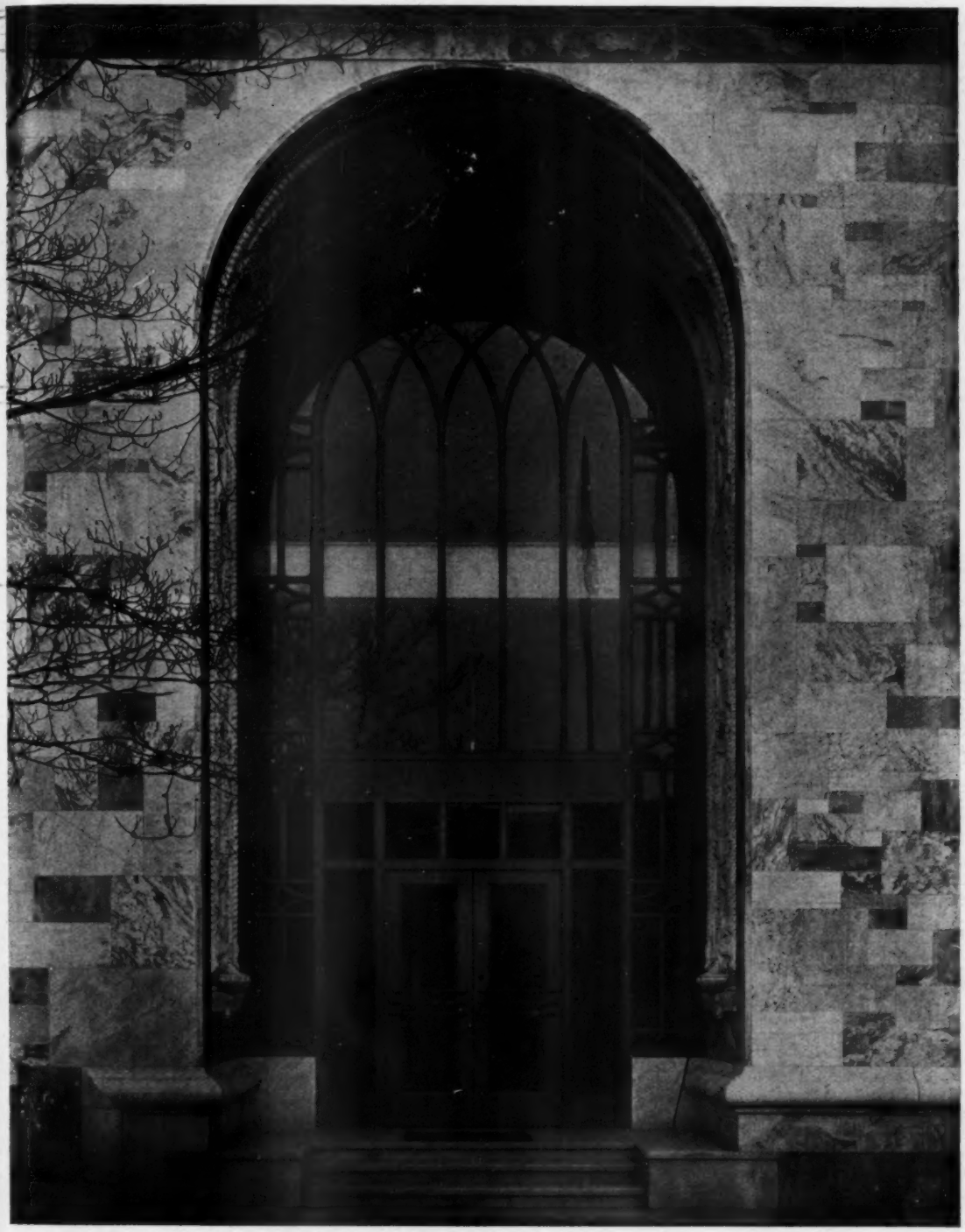
ANATOMY BUILDING



PHYSIOLOGY BUILDING

EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*

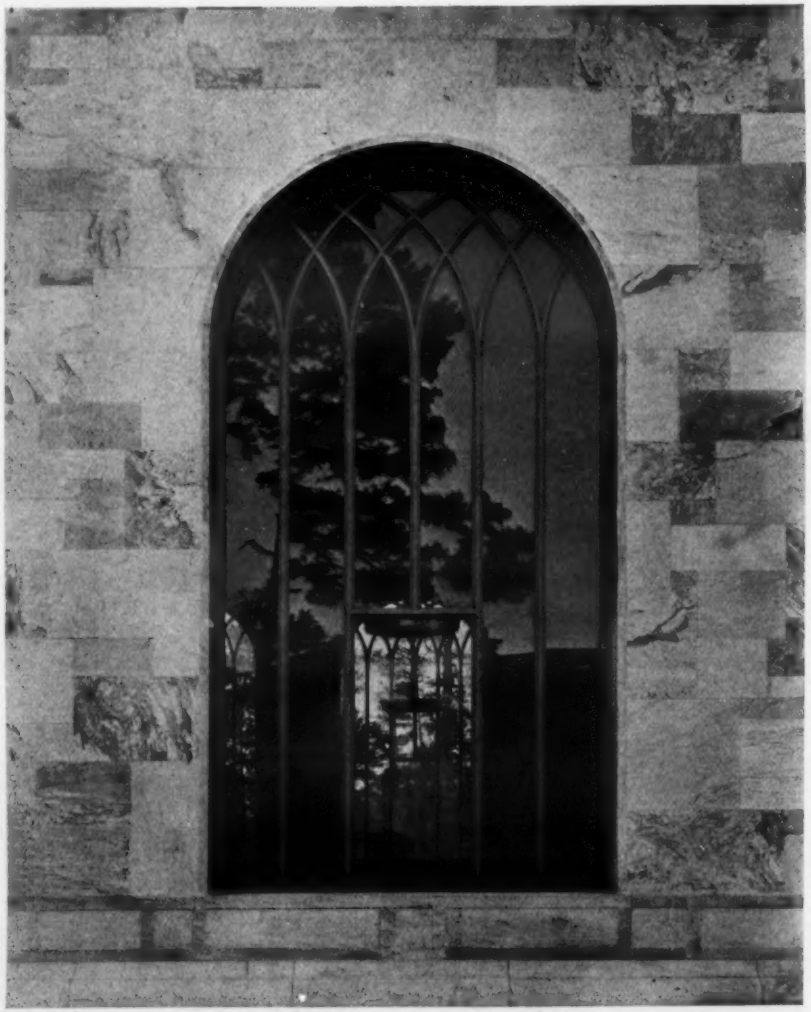


MAIN ENTRANCE, THEOLOGY BUILDING

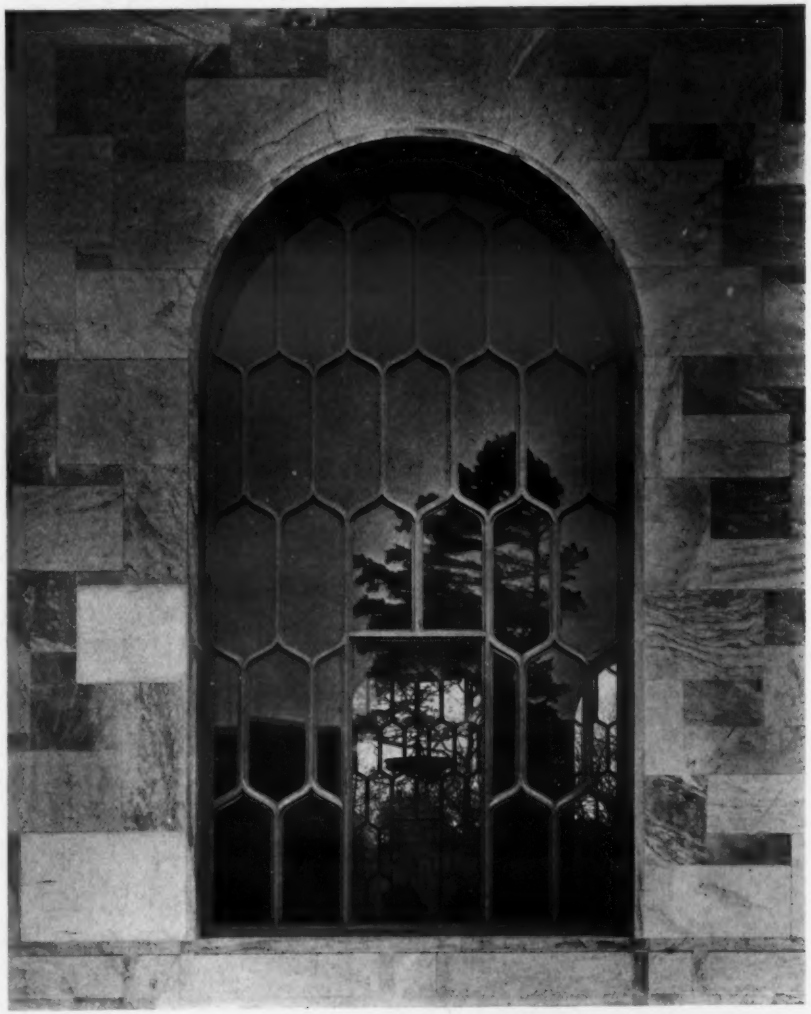
EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*

XUM



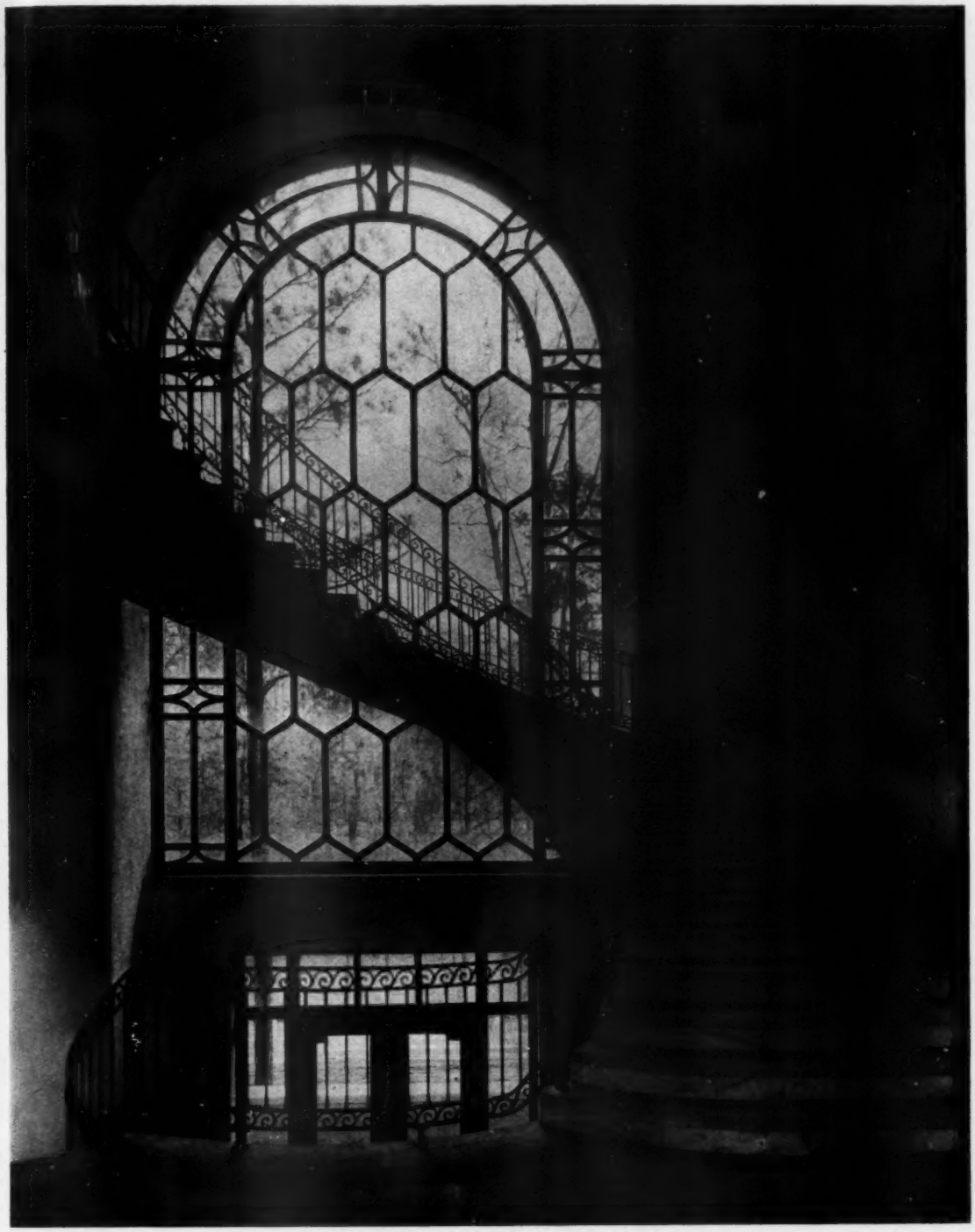
LIBRARY WINDOW, THEOLOGY BUILDING



LIBRARY WINDOW, LAW BUILDING

EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*

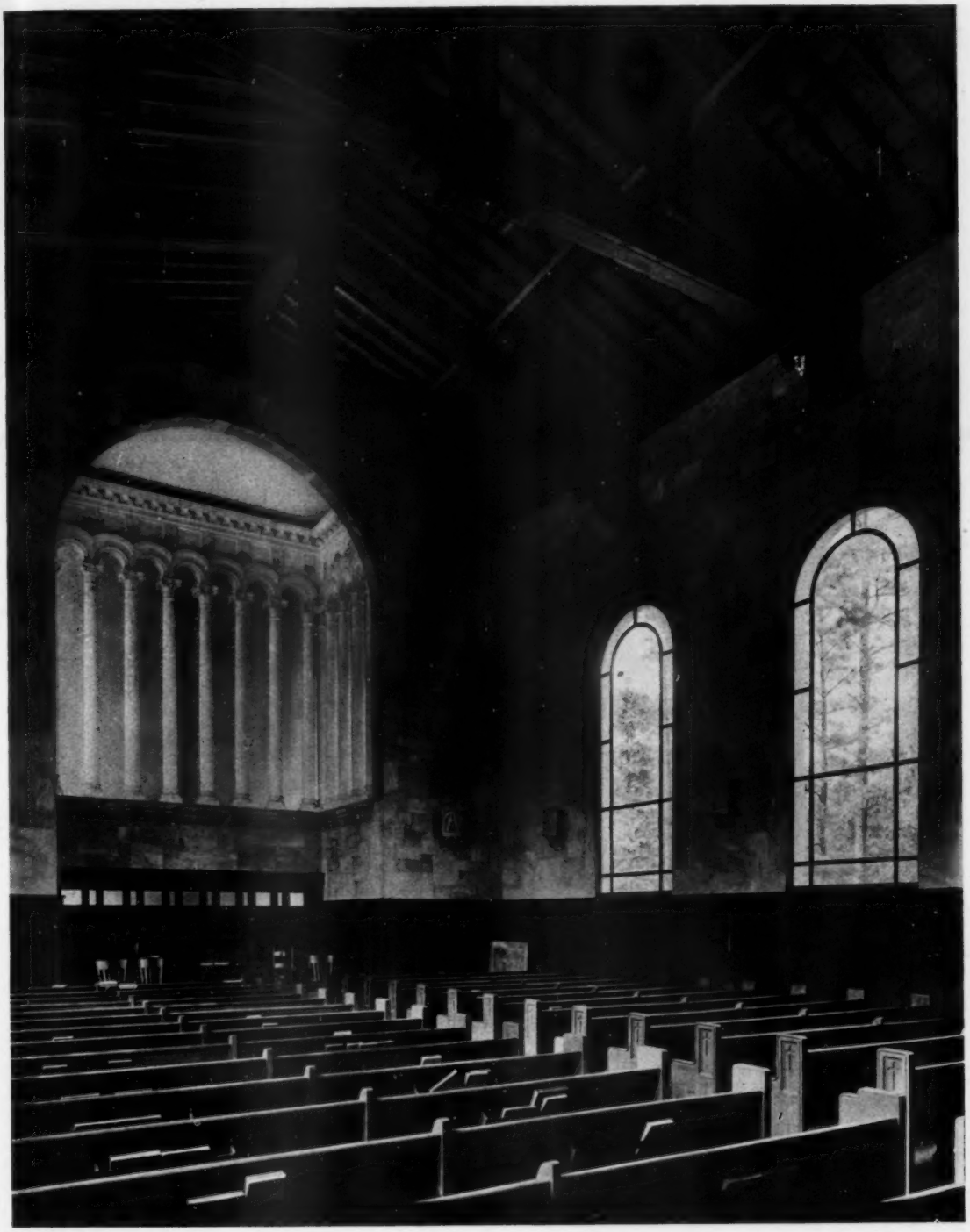


MAIN STAIRWAY, LAW BUILDING

EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*

XUM



INTERIOR OF CHAPEL

EMORY UNIVERSITY, ATLANTA, GA.

H. HORNBOSTEL, *ARCHITECT*

XUM

Report on Paint Exposure Tests at Atlantic City, New Jersey

By Henry A. Gardner.

THE paint exposure test panels consisting of wood and metal, both bare and coated with various types of paint and varnish, exposed on Young's Million Dollar Pier at Atlantic City, N. J., and described in the August 27, 1919, issue of The American Architect, were examined after a period of exposure of one year. Since the composition of the various paints was given in the previous article, this information will not be here repeated. Some very interesting developments have taken place during that time. After the inspection the panels were rearranged for further exposure. The results of the inspection are presented below.

Series I—Tin Plate.

One-half of the back surface of each panel from No. 1 to No. 6 was originally given one coat of spar varnish. Being protected from direct sunlight, the varnish has stood up in most excellent condition, preserving the underlying surface of the panels from corrosion. The uncoated portion of the under surface shows even greater corrosion than the upper sides, which were exposed to sunlight. This is probably due to the constant presence of moisture on the unexposed surfaces. The moisture had, however, but little effect upon the spar varnish in the absence of direct sunlight, although only one coat was used as contrasted with three coats on the surfaces exposed to the sun. These tests indicate that sunlight is probably the most destructive factor in the decay of varnish films. They also indicate the great value of varnish in preserving tin plate or other metals from corrosion. Even the heaviest coated tin plate requires surface protection. Table I gives the details relative to this series.

BACK OF PANEL No. 6—SERIES 1
Upper portion coated with varnish and in good condition. Lower portion, left unprotected, is badly corroded.

Series II—Black Sheet Iron Panels.

The tests on this series indicate that aluminum powder and zinc powder are both valuable metal protectives, but it is apparent that spar varnish or

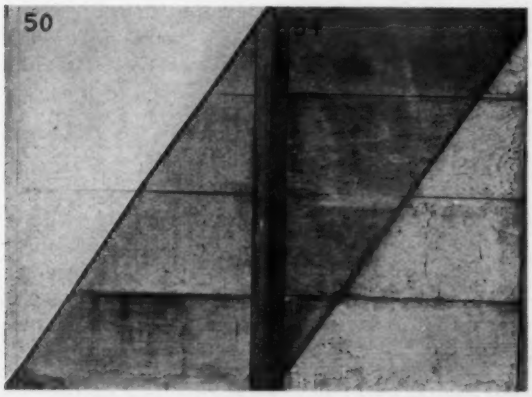
TABLE I.
SERIES I—BARE AND PAINTED TIN PLATE.

No. Panel.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
1	E-X (Tin Coated)	Upper	Vermilion Paint, 3 coats	O. K.
		Lower	Bare	Very rusty.
2	E-X (Tin Coated)	Upper	Spar Varnish	Slight rust spot at center.
		Lower	Bare	Very rusty.
3	E-X (Tin Coated)	Upper	Collodian Dope D, 1 coat	Film scaled off. Some rust.
		Lower	Bare	Very rusty.
4	A-P 40 lb. (Heavy Tin Coated)	Upper	Vermilion Paint, 3 coats	O. K.
		Lower	Bare	Few small pin-hole rust spots.
5	A-P 40 lb. (Heavy Tin Coated)	Upper	Spar Varnish, 3 coats	O. K.
		Lower	Bare	Film scaled off, but no rust.
6	A-P 40 lb. (Heavy Tin Coated)	Upper	Collodian Dope N, 1 coat	Film scaled off, but no rust.
		Lower	Bare	Few small pin-hole rust spots.

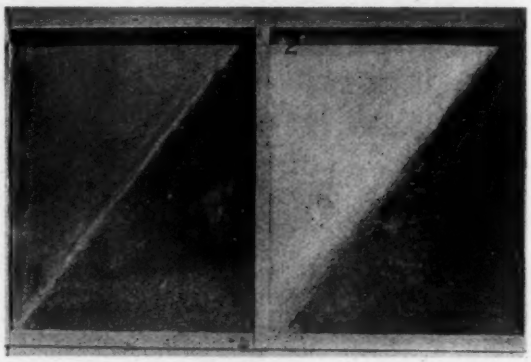
linseed oil are better liquids for exterior exposure than collodion dope, especially in the case of the zinc powder. The very much greater durability of collodion dope containing aluminum powder as compared to clear collodion dope on panel No. 3 or No. 6 should be given attention. The aluminum powder present in the dope has a direct effect in reflecting the sun's rays and thus protecting the dope film from decay. The present condition of these panels is indicated in the last column of Table II.

Series III—Black and Galvanized Sheet Iron and Steel Plates.

In this series of tests the value of a paint coating in protecting metal from corrosion is clearly demonstrated. It is apparent that even the highest grades of carefully made black sheets cannot be exposed for even a short period without surface protection. Test panels No. 11 and 12 show that linseed oil has a



TWO WOOD PANELS OF SERIES V
Upper sections in excellent condition. Lower sections already show decay.



PANELS 1 AND 2 OF SERIES I
This test illustrates the desirability of painted or varnished tin plate. The lower portions, showing rust, were unprotected.

longer life than spar varnish, although the varnish is initially more water-resisting. Table III gives the data in detail relative to this series.

Series IV—War Paints on Sheet Metal.

This series indicates the value of several of the paints made use of by the United States Government during its extensive war work. Except for test panel No. 20 these paints showed to good advantage. Test panel No. 23 indicates the value of grinding pigments in spar varnish to increase the durability of the coating. The light reflecting value of the pigment accomplishes the purpose of protecting the varnish film from decay. The effects of exposure on this series are given in Table IV.

Additional Test Panels.

The results of the tests, insofar as they relate to the wood panels are given in tables V to VIII, inclusive.

The wood panels, consisting of white and yellow pine, cypress and redwood, show very

TABLE II.
SERIES II—BLACK IRON PANELS, BARE AND COATED WITH METAL POWDER COMPOSITIONS.

Panel. No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
7	Open Hearth Steel (Black Sheet)	Upper	Aluminum powder in Spar Var., 2 coats.	O. K.
		Lower	Aluminum powder in Lins'd Oil, 2 coats.	A few pin-hole rust spots.
8	Open Hearth Steel (Black Sheet)	Upper	Aluminum powder in Collodion Dope D, 2 coats	A few slight rust spots.
		Lower	Bare	Very rusty.
9	Open Hearth Steel (Black Sheet)	Upper	Zinc powder in Spar Varnish, 2 coats.	O. K.
		Lower	Zinc powder in Linseed Oil, 2 coats.	A few slight rust spots.
10	Open Hearth Steel (Black Sheet)	Upper	Zinc powder in Collodion Dope D, 2 coats.	Scaled off in many spots.
		Lower	Bare	Very rusty.

XUM

TABLE III.

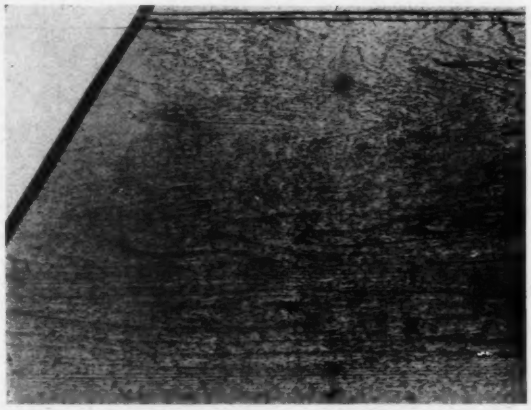
SERIES III—BLACK AND GALVANIZED SHEET IRON AND STEEL PLATES.

Panel. No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
11	Open Hearth Steel (Galvanized)	Upper	Spar Varnish, 3 coats	Protective film nearly gone.
		Lower	Bare	O. K.
12	Open Hearth Steel (Galvanized)	Upper	Linseed Oil, 3 coats	O. K.
		Lower	Bare	O. K.
13	Open Hearth Steel (Galvanized)	Upper	Copper brushed, then vermilion paint, 3 coats	Film showing slight scaling.
		Lower	Bare	O. K.
14	Open Hearth Steel (Black Sheet)	Upper	Vermilion paint, 3 coats	O. K.
		Lower	Bare	Very rusty.
15	Copperized Steel (Galvanized)	Upper	Copper brushed, then vermilion paint, 3 coats	Film showing slight scaling.
		Lower	Bare	O. K.
16	Copperized Steel (Black Sheet)	Upper	Vermilion paint, 3 coats	O. K.
		Lower	Bare	Very rusty.
17	R-R Iron (Galvanized)	Upper	Copper brushed, then vermilion paint, 3 coats	O. K.
		Lower	Bare	O. K.
18	R-R Iron (Black Sheet)	Upper	Vermilion paint, 3 coats	O. K.
		Lower	Bare	Very rusty.
19	R-R Iron (Heavy Tin Coating)	Upper	Vermilion paint, 3 coats	O. K.
		Lower	Bare	Badly spotted with rust.

clearly the need of surface protection by timber.

An inspection of the "close-up" of one of the panels of Series V, reproduced on page 448, shows the extent to which the weather etching has progressed during a period of only twelve months, whereas the surfaces protected by paint or varnish are in excellent condition. The value of lead and zinc paints was brought out during the war, and the behavior of the prepared lead and zinc paint used on panels 50 to 53 of Series V is of interest.

Although the manufacture of paint dates back many years, it is true that we yet have much to learn about this product. When the materials and labor which entered into the manufacture of paint, as well as the labor necessary for its application, were less costly than today there was perhaps greater excuse for a lack of definite knowledge as to the service which combinations of various pigments and vehicles would give. But when we consider the cost of application alone, it is distinct economy to use the paint or varnish which will give the greatest protection for the longest period. It therefore becomes necessary for the architect, as far as possible, to acquaint himself with the service records of different compositions in order to know the merits of these protecting coatings. The Educational Bureau, Scientific Section of the Paint Manufacturers' Association of the United States, with which the National Varnish Manufacturers' Association is co-operating, and of which the author is director, has been conducting investigations which are making available such data.



DETAIL VIEW OF UNPROTECTED WOOD PANEL IN SERIES V

Note the spots and excessive pitting.

TABLE IV.

SERIES IV—WAR PAINTS ON SHEET METAL.

Panel. No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
20	Open Hearth Steel (Black Sheet)	Upper	Spar Varnish (W. D. 6), 3 coats	Film disintegrated and rust developed.
		Lower	Bare	Very rusty.
21	Open Hearth Steel (Black Sheet)	Upper	Spar Varnish, 3 coats	Film disintegrated and rust developed.
		Lower	Linseed Oil, 3 coats	Rusty below oil film but film is in good condition
22	Open Hearth Steel (Black Sheet)	Upper	Camouflage O. R. 333, 3 coats	O. K.
		Lower	Camouflage N. O. R. 334, 3 coats	O. K.
23	Open Hearth Steel (Black Sheet)	Upper	Yellow W. D. 37 and Olive Green W. D. 33 Projectile Paints, 3 coats	These four paints show very dull surface
		Lower	Blue W. D. 34 and Black W. D. 38 Projectile Paints, 3 coats	Only a very few slight rust spots discernible.
24	Open Hearth Steel (Black Sheet)	Upper	Brown Enamel Primer W. D. 13, 1 coat.	
		Lower	Red Oxide W. D. 11, 2 coats	O. K.
25	Open Hearth Steel (Black Sheet)	Upper	Reinforced Red Lead Ready Mixed W. D. 40, 3 coats	O. K., but slightly dull.
		Lower	Red Lead Hand Mixed, 3 coats	O. K.
26	Open Hearth Steel (Black Sheet)	Upper	Helmet Paint, 3 coats	Heavy checking.
		Lower	Navy Camouflage, Gray, 3 coats	O. K.
27	Open Hearth Steel (Black Sheet)	Upper	Standard Olive Drab, W. D. 28, 3 coats	O. K.
		Lower	Quick Drying Olive Drab W. D. 29, 3 coats	Few slight pin-hole rust spots.

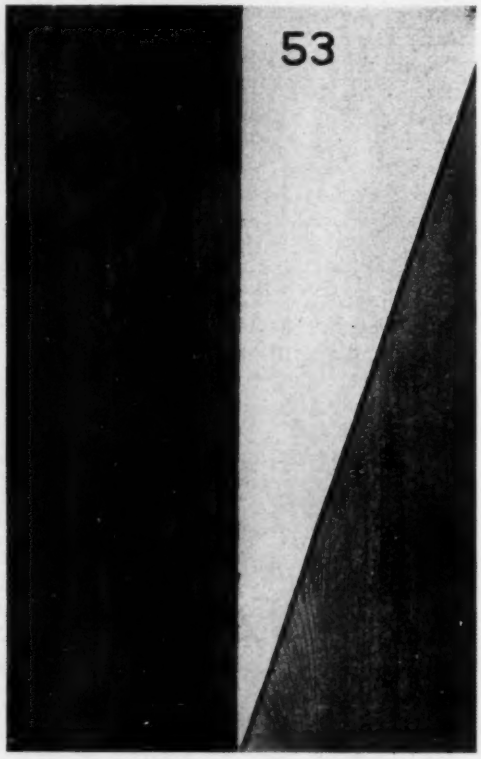
TABLE V.

SERIES V.—WOOD PANEL TESTS.

Panel No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
50	White Pine	Upper	White Paint, 3 coats	Painted or varnished wood surfaces are in generally excellent condition. Uncoated wood surfaces are rough, pitted, weather-etched, and covered with spots of black fungus growth.
		Lower	Bare	
51	Yellow Pine	Upper	White Paint, 3 coats	
		Lower	Bare	
52	Cypress	Upper	White Paint, 3 coats	
		Lower	Bare	
53	Red Wood	Upper	White Paint, 3 coats	
		Lower	Bare	
54	White Pine	Upper	Spar Varnish, 3 coats	
		Lower	Bare	
55	Yellow Pine	Upper	Spar Varnish, 3 coats	
		Lower	Bare	
56	Cypress	Upper	Spar Varnish, 3 coats	
		Lower	Bare	
57	Red Wood	Upper	Spar Varnish, 3 coats	
		Lower	Bare	

ABOVE—CLOSE-UP VIEW OF UNPROTECTED WOOD PANEL OF SERIES V

Note weather etching, pitting, etc.



AT RIGHT—PANELS 57 AND 53 OF SERIES V

Upper portion of panel 57 coated with spar varnish; of 53 with white paint. Both are in excellent condition. Lower portions of both panels left bare. These are rough, weather etched, etc.

TABLE VI.

SERIES VI.—WAR PAINTS ON WOOD.

Panel No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
58	Cypress	Entire Panel.	Primed with Red Lead, then:	O. K. Moderate chalking only.
		Upper	Exterior Paint, Pearl Gray W. D. 50, 3 coats	
		Lower	Exterior Fire Resisting Paint, Gray Green W. D. 21, 3 coats	
59	Cypress	Entire Panel.	Primed with Red Lead, then:	O. K., except where bird shot have penetrated 2 upper boards. Moderate chalking developed.
		Upper Board 1.	Anti-Actinic Wing Enamel Army Olive Drab, 3 coats	
		Upper Board 2.	Anti-Actinic Wing Enamel Light Gray, 3 coats	
		Lower Boards 1 and 2	Anti-Actinic Wing Enamel Semi-Flat Navy Dept. Aero. Spec. C. & R. No. 3, 3 coats	

TABLE VII.

SERIES VII.—SPECIAL PRIMER TESTS ON WOOD.

Panel. No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
60	Yellow Pine	Upper 2 Boards	Vermilion Paint, 1 coat	White paint checking over black and red.
		Lower 2 Boards	Lampblack, 1 coat	Panel removed for Laboratory study.
		Right half of panel	Then coated with White Paint, 3 coats.	
		Left half of panel	Coated with Spar Varnish, 3 coats.	
61	Cypress	Upper 2 Boards	Vermilion Paint, 1 coat	
		Lower 2 Boards	Lampblack, 1 coat	
		Right half of panel	Then coated with White Paint, 3 coats.	O. K.
		Left half of panel	Coated with Spar Varnish, 3 coats.	
62	White Pine	Upper 2 Boards	Lampblack, 1 coat; then White Paint, 3 coats	Heavy checking noted over lampblack. Panel removed for Laboratory study.
		Lower 2 Boards	Bare, then White Paint, 3 coats	

TABLE VIII.

SERIES VIII.—SPECIAL TESTS.

Panel. No.	Description of Panel.	Section of Panel.	Treatment.	Condition After Exposure for 1 Year.
63	White Pine	1st Board	Red Paint, 3 coats	Panel removed for Laboratory study of thermal properties.
		2d Board	Green Paint, 3 coats.	
		3d Board	Yellow Paint, 3 coats.	
		4th Board	Black Paint, 3 coats.	
64	White Pine	Upper 2 Boards	Red Oxide Machine Ground, 3 coats	O. K.
		Lower 2 Boards	Rex Oxide Hand Mixed, 3 coats.	
65	White Pine	Upper 2 Boards	White Paint Pure Oil, 3 coats	Good condition except where birdshot have penetrated 2 upper boards. Panel removed for Laboratory study.
		Lower 2 Boards	White Paint Foots Oil, 3 coats	
66	White Pine	1st Board	White Paint B-T-X.	
		2d Board	Yellow Paint B-T-X.	Very slight checking and moderate chalking. Few slight scale spots at joints.
		3d Board	Gray Paint B-T-X.	
		4th Board	Blue Paint B-T-X.	
67	White Pine	1st Board	White Paint L-Z-X.	
		2d Board	Yellow Paint L-Z-X.	Very slight checking and moderate chalking. Few slight scale spots at joints.
		3d Board	Gray Paint L-Z-X.	
		4th Board	Blue Paint L-Z-X.	
68	White Pine	Upper	Spar Varnish, 5 coats	Disappeared from fence.
		Lower	Linseed Oil, 5 coats.	

Many Problems Confront Construction Industry

The recent action of the Federal Reserve Board in the curtailments of credit is being interpreted by many member banks as a further curtailment of loans on construction, but the usury laws already prevent bidding by the construction industry of interest rates in competition with the consumables and luxuries of commerce. On the other hand, rent regulating laws make housing less and less attractive to capital, and as money goes where it makes friends, the housing shortage is accumulating.

Relief can only come through the coöperation of the transportation, financial and labor groups, and there are those who now venture to state that it cannot be realized unless new construction is exempted from taxation for a period of years.

The curtailment of construction during the war, the successive freight embargoes, the discrimination against long term loans, labor troubles, difficulty of obtaining fuel, together with the uncertainty of returns from rentals, occurring successively during the past five years, have hardly left the construction industry without some element of change or restriction for a month at a time.

To those engaged in the construction industry who believe that the very basis of credit is earning power, whether it be the earning power of the individual, the firm or a community, it is very evident that the earning power of the nation is decreasing through the continued dilapidation of its plant, and it is equally evident to them that the practical way to increase production is to increase the means of production and distribution—the tools of industry, and that the deferring of the rehabilitation of construction will not decrease the ultimate cost of the structures but will result in a continued loss to those who need to use the transportation systems, the highways and housing.

With the uncertainty of freight, fuel and labor on the one hand and the uncertainty of returns through rent regulations on the other hand, those engaged in the construction industries, are in the position of the unfortunate billiard player who was condemned to play "on a cloth untrue, with a twisted cue and elliptical billiard balls."

It is believed, however, that the Senate Committee will carefully weigh the presentation of the various phases of the matters which influence the construction of the nation, that it does not favor a housing subsidy or a national housing program

Short Cuts to Accurate Calculations

Computing Steam Radiation

WHILE it may often be necessary to make extended calculations in the design of a heating system, yet many cases will present themselves in which it will be possible to arrive at a solution by the use of either the accompanying table or chart with but a small amount of multiplication. Both are presented, and it will be found that very close results are obtainable by the use of either. It is quite possible that the table will appeal to some, while the chart will seem more simple of application to others. By the use of the latter, less calculation is required.

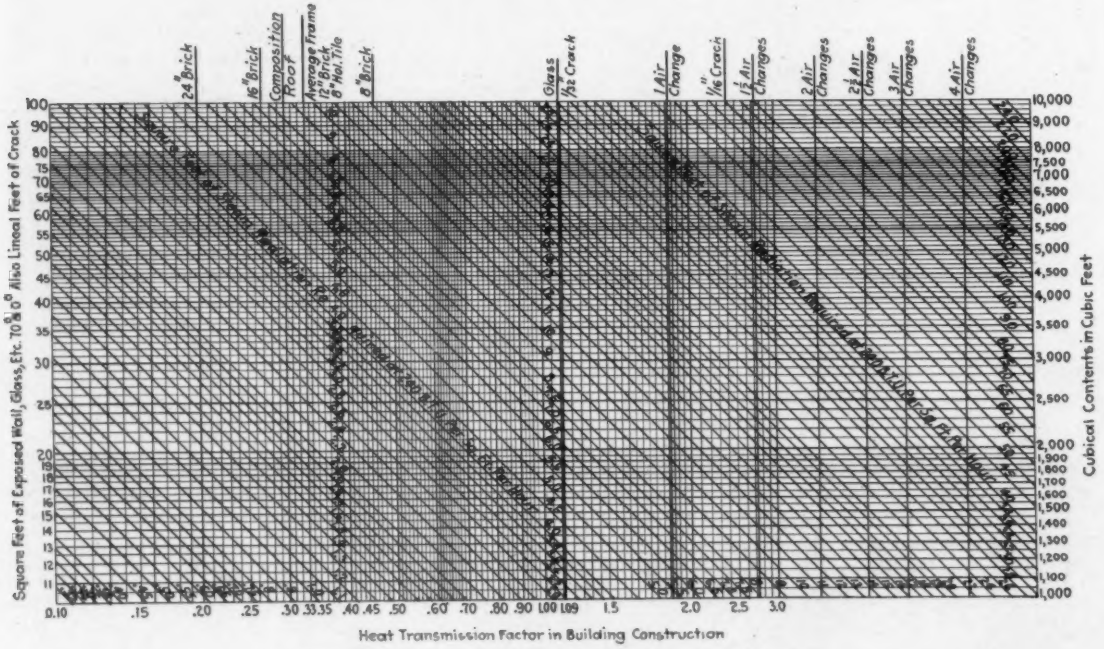


CHART FOR COMPUTING STEAM RADIATION

In order to demonstrate the use of these time saving helps, several examples will be worked out. It might be well, however, first to outline the method of procedure in computing the heat loss of any enclosed space.

First, heat is lost through the walls, windows, floors, ceilings, etc., the quantity depending on the nature of the construction and difference between inside and outside temperature; secondly, heat is lost by leakage at doors and windows. Unless forced ventilation is used this leakage is responsible for the air change in the room, which is assumed at one or more complete changes per hour, depending on the tightness of the construction. The radiator must supply sufficient heat to make up the deficit caused by these two factors. The area of exposed wall and glass surface must be computed and multiplied by the proper factors, and also the air change per hour in cubic feet. If this is but one per hour, it will, of course, equal the cubical contents of the room. For roofs and floors over unheated spaces, heat loss through such construction must also be taken into consideration.

Problem No. 1.—To determine the number of square feet of steam radiation required to maintain an inside temperature of 70 deg. F. with an outside temperature of zero, for a room 20 x 30 ft. and 10 ft. high, exposed on the 30 ft. side only, this wall containing five windows 5 x 5 ft. each. One air change per hour. Exterior wall constructed of brick, 12 in. thick.

Solution.—Total exposed wall surface (30 x 10 less area of windows) = 200 sq. ft.

Total area of windows = 4 x 5 x 5 = 100 sq. ft.

Air change per hour (cubical contents of room) = 20 x 30 x 10 = 6000 cu. ft.

By reference to the table, we have under the column headed "70 deg." and opposite "12 in. brick wall" a factor of .0868 which must be multiplied by the wall area, giving 200 x .0868 = 17.36.

Similarly, the area of single window surface (in sq. ft.) multiplied by the value opposite "Single window" and in the column with caption of "70 deg." gives 100 x .2884 = 28.84.

To provide for leakage, multiply the cubical contents of the room by the factor opposite "One air change per hour" in the column with caption of "70 deg." This gives 6000 x .0056 = 33.60.

Adding these we have—Total radiation required = 17.36 + 28.84 + 33.60 = 79.80 sq. ft.

To solve this problem by use of the chart proceed as follows:

Run along left hand vertical line marked "Square Feet of Exposed Wall, Glass, Etc." until a figure corresponding to the wall area is encountered. Since this only gives values up to 100, for larger areas it is necessary to take values of one-tenth and multiply the results obtained by ten. In this case the exposed wall area is 200, so we take a value of 20. Trace this line across horizontally to the right until it intersects the vertical line marked "Average frame and 12 in. brick." Find value of diagonal line passing through point of intersection, in this case 1.9, which multiplied by 10 gives 19. Proceed in a similar manner for the window surface. Here we find the intersection of the horizontal line representing

TABLE FOR COMPUTING STEAM RADIATION

MATERIAL		Heat Loss per sq. ft.	Difference Between Inside and Outside Temperatures																			
			1°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°	110°
One air change per hour per cu. ft. contents			.00006	.0008	.0012	.0016	.002	.0024	.0028	.0032	.0036	.004	.0044	.0048	.0052	.0056	.006	.0064	.0068	.0072	.0076	.008	.0084	.0088
Single Window		1.03	.00412	.0412	.0618	.0824	.103	.1236	.1442	.1648	.1854	.206	.2266	.2472	.2678	.2884	.309	.3296	.3502	.3708	.3914	.412	.4326	.4532
Double Window		.518	.00207	.0207	.03105	.0414	.05175	.0621	.07245	.0828	.09315	.1035	.11385	.1242	.13455	.1449	.15525	.1656	.17595	.1863	.19665	.207	.21735	.22177
Single Skylight		1.118	.00447	.0447	.06705	.0894	.11175	.1341	.15645	.1788	.20115	.2235	.24585	.2682	.29055	.3129	.33525	.3576	.37995	.4023	.42465	.447	.46935	.4917
Double Skylight		.621	.00248	.0248	.0372	.0496	.062	.0744	.0868	.0992	.1116	.124	.1364	.1488	.1612	.1736	.186	.1984	.2108	.2232	.2356	.248	.2604	.2728
Brick Wall	4"	.68	.00272	.0272	.0408	.0544	.068	.0816	.0952	.1088	.1224	.136	.1496	.1632	.1768	.1904	.204	.2176	.2312	.2448	.2584	.272	.2856	.2992
" "	8"	.46	.00184	.0184	.0276	.0368	.046	.0552	.0644	.0736	.0828	.092	.1012	.1104	.1196	.1288	.138	.1472	.1564	.1656	.1748	.184	.1932	.2024
" "	12"	.31	.00124	.0124	.0186	.0248	.031	.0372	.0434	.0496	.0558	.062	.0682	.0744	.0806	.0868	.093	.0992	.1054	.1116	.1178	.124	.1302	.1364
" "	16"	.26	.00104	.0104	.0156	.0208	.026	.0312	.0364	.0416	.0468	.052	.0572	.0624	.0676	.0728	.078	.0832	.0884	.0936	.0998	.104	.1092	.1144
" "	20"	.23	.00092	.0092	.0138	.0184	.023	.0276	.0322	.0368	.0414	.046	.0506	.0552	.0598	.0644	.069	.0736	.0782	.0828	.0874	.092	.0966	.1012
" "	24"	.20	.0008	.008	.012	.016	.02	.024	.028	.032	.036	.04	.044	.048	.052	.056	.06	.064	.068	.072	.076	.08	.084	.088
" "	28"	.174	.0007	.007	.0105	.014	.0175	.021	.0245	.028	.0315	.035	.0385	.042	.0455	.049	.0525	.056	.0595	.063	.0665	.07	.0735	.077
" "	32"	.15	.0006	.006	.009	.012	.015	.018	.021	.024	.027	.03	.033	.036	.039	.042	.045	.048	.051	.054	.057	.06	.063	.066
" "	36"	.13	.00052	.0052	.0078	.0104	.013	.0156	.0182	.0208	.0234	.026	.0286	.0312	.0338	.0364	.039	.0416	.0442	.0468	.0494	.052	.0546	.0572
" "	40"	.115	.00046	.0046	.0069	.0092	.0115	.0138	.0161	.0184	.0207	.023	.0253	.0276	.0299	.0322	.0345	.0368	.0391	.0414	.0437	.046	.0483	.0506
Stone Wall	4"	.91	.00364	.0364	.0546	.0728	.091	.1092	.1274	.1456	.1638	.182	.2002	.2184	.2366	.2548	.273	.2912	.3094	.3276	.3458	.364	.3822	.4004
" "	8"	.61	.00244	.0244	.0366	.0488	.061	.0732	.0854	.0976	.1098	.122	.1342	.1464	.1586	.1708	.183	.1952	.2074	.2196	.2318	.244	.2562	.2684
" "	12"	.41	.00164	.0164	.0246	.0328	.041	.0492	.0574	.0656	.0738	.082	.0902	.0984	.1066	.1148	.123	.1312	.1394	.1476	.1558	.164	.1722	.1804
" "	16"	.35	.0014	.014	.021	.028	.035	.042	.049	.056	.063	.07	.077	.084	.091	.098	.105	.112	.119	.126	.133	.14	.147	.154
" "	20"	.31	.00124	.0124	.0186	.0248	.031	.0372	.0434	.0496	.0558	.062	.0682	.0744	.0806	.0868	.093	.0992	.1054	.1116	.1178	.124	.1302	.1364
" "	24"	.27	.00108	.0108	.0162	.0216	.027	.0324	.0378	.0432	.0486	.054	.0594	.0648	.702	.0756	.081	.0864	.0918	.0972	.1026	.108	.1134	.1188
" "	28"	.23	.00092	.0092	.0138	.0184	.023	.0276	.0322	.0368	.0414	.046	.0506	.0552	.0598	.0644	.069	.0736	.0782	.0828	.0874	.092	.0966	.1012
" "	32"	.20	.0008	.008	.012	.016	.02	.024	.028	.032	.036	.04	.044	.048	.052	.056	.06	.064	.068	.072	.076	.08	.084	.088
" "	36"	.17	.00068	.0068	.0102	.0136	.017	.0204	.0238	.0272	.0306	.034	.0374	.0408	.0442	.0476	.051	.0544	.0578	.0612	.0646	.068	.0714	.0748
" "	40"	.15	.0006	.006	.009	.012	.015	.018	.021	.024	.027	.03	.033	.036	.039	.042	.045	.048	.051	.054	.057	.06	.063	.066
Concrete Wall	4"	.62	.00328	.0328	.0492	.0656	.082	.0984	.1148	.1312	.1476	.164	.1804	.1968	.2132	.2296	.246	.2624	.2788	.2952	.3116	.328	.3444	.3608
" "	8"	.55	.0022	.022	.033	.044	.055	.066	.077	.088	.099	.11	.121	.132	.143	.154	.165	.176	.187	.198	.209	.22	.231	.242
" "	12"	.37	.00148	.0148	.0222	.0296	.037	.0444	.0518	.0592	.0666	.074	.0814	.0888	.0962	.1036	.111	.1184	.1258	.1332	.1406	.148	.1554	.1628
" "	16"	.31	.00124	.0124	.0186	.0248	.031	.0372	.0434	.0496	.0558	.062	.0682	.0744	.0806	.0868	.093	.0992	.1054	.1116	.1178	.124	.1302	.1364
" "	20"	.28	.00112	.0112	.0168	.0224	.028	.0336	.0392	.0448	.0504	.056	.0616	.0672	.0728	.0784	.084	.0896	.0952	.1008	.1064	.112	.1176	.1232
" "	24"	.24	.00096	.0096	.0144	.0192	.024	.0288	.0336	.0384	.0432	.048	.0528	.0576	.0624	.0672	.072	.0768	.0816	.0864	.0912	.096	.1008	.1056
" "	28"	.21	.00084	.0084	.0126	.0168	.021	.0252	.0294	.0336	.0378	.042	.0462	.0504	.0546	.0588	.063	.0672	.0714	.0756	.0798	.084	.0882	.0924
" "	32"	.18	.00072	.0072	.0108	.0144	.018	.0216	.0252	.0288	.0324	.036	.0396	.0432	.0468	.0504	.054	.0576	.0612	.0648	.0684	.072	.0756	.0792
" "	36"	.16	.00064	.0064	.0096	.0128	.016	.0192	.0224	.0256	.0288	.032	.0352	.0384	.0416	.0448	.048	.0512	.0544	.0576	.0608	.064	.0672	.0704
" "	40"	.14	.00056	.0056	.0084	.0112	.014	.0168	.0196	.0224	.0252	.028	.0308	.0336	.0364	.0392	.042	.0448	.0476	.0504	.0532	.056	.0588	.0616
Hollow Tile Wall	4"	.51	.00204	.0204	.0306	.0408	.051	.0612	.0714	.0816	.0918	.102	.1122	.1224	.1326	.1428	.153	.1632	.1734	.1836	.1938	.204	.2142	.2244
" " "	8"	.345	.00138	.0138	.0207	.0276	.0345	.0414	.0483	.0552	.0621	.069	.0759	.0828	.0897	.0966	.1035	.1104	.1173	.1242	.1311	.138	.1449	.1518
" " "	12"	.23	.00092	.0092	.0138	.0184	.023	.0276	.0322	.0368	.0414	.046	.0506	.0552	.0598	.0644	.069	.0736	.0782	.0828	.0874	.092	.0966	.1012
" " "	16"	.195	.00078	.0078	.0117	.0156	.0195	.0234	.0273	.0312	.0351	.039	.0429	.0468	.0507	.0546	.0585	.0624	.0663	.0702	.0741	.078	.0819	.0858
" " "	20"	.17	.00068	.0068	.0102	.0136	.017	.0204	.0238	.0272	.0306	.034	.0374	.0408	.0442	.0476	.051	.0544	.0578	.0612	.0646	.068	.0714	.0748
" " "	24"	.15	.0006	.006	.009	.012	.015	.018	.021	.024	.027	.03	.033	.036	.039	.042	.045	.048	.051	.054	.057	.06	.063	.066
Studs with Clap Boards		.44	.00176	.0176	.0264	.0352	.044	.0528	.0616	.0704	.0792	.088	.0968	.1056	.1144	.1232	.132	.1408	.1496	.1584	.1672	.176	.1848	.1936
Studs with Clap Boards & Bldg. Paper		.31	.00124	.0124	.0186	.0248	.031	.0372	.0434	.0496	.0558	.062	.0682	.0744	.0806	.0868	.093	.0992	.1054	.1116	.1178	.124	.1302	.1364
" " " " Paper & ½" Sheath		.23	.00092	.0092	.0138	.0184	.023	.0276	.0322	.0368	.0414	.046	.0506	.0552	.0598	.0644	.069	.0736	.0782	.0828	.0874	.092	.0966	.1012
" " " " & ¼" Sheathing		.28	.00112	.0112	.0168	.0224	.028	.0336	.0392	.0448	.0504	.056	.0616	.0672	.0728	.0784	.084	.0896	.0952	.1008	.1064	.112	.1176	.1232
Roof - Slate Exposed		.80	.0032	.032	.048	.064	.08	.096	.112	.128	.144	.16	.176	.192	.208	.224	.24	.256	.272	.288	.304	.32	.336	.352
Roof - Slate Over Wood		.30	.0012	.012	.018	.024	.03	.036	.042	.048	.054	.06	.066	.072	.078	.084	.09	.096	.102	.108	.114	.12	.126	.132
Roof - Iron Exposed		1.32	.00528	.0528	.0792	.1056	.132	.1584	.1848	.2112	.2376	.264	.2904	.3168	.3432	.3696	.396	.4224	.4488	.4752	.5016	.528	.5544	.5808
Roof - Iron Over Wood		.17	.00068	.0068	.0102	.0136	.017	.0204	.0238	.0272	.0306	.034	.0374	.0408	.0442	.0476	.051	.0544	.0578	.0612	.0646	.068	.0714	.0748
Roof - Composition Over Wood		.30	.0012	.012	.018	.024	.03	.036	.042	.048	.054	.06	.066	.072	.078	.084	.09	.096	.102	.108	.114	.12	.126	.132
Roof - ⅞" Tile - 1" Thick		.80	.0032	.032	.048	.064	.08	.096	.112	.128	.144	.16	.176	.192	.208	.224	.24	.256	.272	.288	.304	.32	.336	.352

100 sq. ft. and the vertical line marked "Glass" are on the diagonal line marked 32.

For leakage, run along the vertical line at the extreme right marked "Cubical Contents in Cubic Feet" until the horizontal line representing 6,000 is reached. Trace this to the left until it intersects the vertical line marked "1 air change." The diagonal line passing through this intersection is marked 32. Adding these three values we have 19 + 32 + 32 = 83 cu. ft. radiation, about 4 per cent. more than previously determined by the table.

Problem No. 2.—Determine the steam radiation required for a one story building, 50 ft. 8 in. by 100 ft. 8 in. in area, 18 ft. high, with 16 in. brick walls and exposed on all sides. There are 10 windows, each 15 ft. wide by 7 ft. high, and 5 windows 10 x 7 ft., also a door 10 x 10 ft. Composition roof on wood sheathing. One air change per hour. System must provide inside temperature of 70 ° F. when outside temperature is zero.

Solution.—Inside dimensions are 48 x 98, making total inside perimeter 292 ft., and a total wall area

Roof area = 48 x 98 = 4704 sq. ft.

Window and door area = (10 x 15 x 7) + (5 x 10 x 7) + (10 x 10) = 1500 sq. ft.

Area brick wall = (5256 — 1500) = 3756 sq. ft.

Room area = 48 x 98 = 4704 sq. ft.

Cubical contents = 48 x 98 x 18 = 84, 672 cu. ft.

From the table we have:

For 16 in. brick wall...	3756 x .0728	= 274
Single windows.....	1500 x .2884	= 433
Composition roof.....	4704 x .084	= 395
Leakage	84672 x .0055	= 475
Total		1577 sq. ft.

Solving by the chart we have:

16 in. brick wall.....	290
Windows	470
Roof	410
Leakage	450
Total	1620 cu. ft.

Here the difference amounts to but 2⅜ per cent. which is very slight.

Some difference of opinion exists as to the proper values of the constants used for different types of building construction, but the differences are so slight as to be negligible.

In *selecting* the sizes of radiators, if the *exact* area of radiation cannot be obtained in the style of radiator selected, use the size which will give the least excess radiation. Do not use less radiation than computed. For bad exposures (north or west) it is good practice to add from 5 to 10 per cent. to the computed radiation placed on that side to take care of this condition.

Illuminating Engineers to Hold Convention

THE date for the next annual convention of the Illuminating Engineering Society, to be held in Cleveland, originally set for September 27-30, has been changed to October 4-7. The change was made to avoid conflict with the American Legion Convention to be held in Cleveland the last week in September, it being felt that the gathering together, in one city and at the same time, of the two organizations, would cause visitors to suffer inconveniences.

It is the aim of the committee to make this convention carry a popular appeal not only to technical men, but to all those in any way interested in illumination. Attendance of men, such as architects, contractors and educators, as well as jobbers and dealers—men who can put the better lighting idea before the public has been solicited.

Classification and Compensation for Engineers

IT is doubtless known that engineers in all branches of the profession have suffered serious hardship during the past three years from the great decrease in buying power of the dollar. In few cases has their pay been increased sufficiently to offset any large proportion of the increased cost of living.

Engineering Council, which represents over 45,000 engineers in all parts of the United States, has had this matter under investigation for over a year. The standard classification of grading for engineering service, with a tentative schedule of standard rates of compensation in each of the proposed grades as contained in the report of the Council's special Committee on the Classification and Compensation of Engineers follows:

Adopted Grades	Compensation Schedule (Tentative)
Junior Aid	$1,080 to $1,560
Aid	1,680 to 2,400
Senior Aid	2,520 to 3,240
Junior Assistant Engineer....	1,620 to 2,580
Assistant Engineer	2,700 to 4,140
Senior Assistant Engineer....	4,320 to 5,760
Engineer	5,940 and upwards
Chief Engineer	8,100 and upwards

Engineering Council has approved this classification, and it is believed to be applicable to all branches of engineering service.

Current News

Happenings and Comments in the Field of Architecture and the Allied Arts

American Art

The progress of art in the United States is too little appreciated abroad, according to a Danish authority who stands high in the artistic world. He is sailing back to Europe after a visit in this country, with the avowed intention of enlightening the old world on the amazing status of painting and sculpture in the new.

Not only did the professor find American collections, public and private, of the old masters noteworthy; he was also deeply impressed with the strength, beauty and vigor of the work of contemporary American artists.

It is to be hoped that the stamp of European approval upon American art will lead to better appreciation of it by Americans, and that those who have money to spend for this sort of thing will spend a fairer share of it among their own countrymen.

History of Landscape Painting

We are accustomed to seeing nature so widely represented in art that we take for granted that this must have been contemporary with the birth of art.

But the art of painting had been appreciated and patronized for centuries before the landscape came into its own. A good account of its rise to recognition appeared in a recent issue of the Houston *Chronicle*. Here it was stated that during the middle ages when painting was thriving in Italy the subject that engrossed all minds was religion. Everything was done from the viewpoint of the church and with its objective the advancement of the church, and painting was recognized as a good medium to spread the story and the doctrine of the church. Therefore, as a study of the pictures of the old masters will show, most painting then was either historical or religious.

With the great reawakening of the Renaissance men began to appreciate the beauties of nature which they had so long taken for granted. They became conscious that nature was good to look upon, therefore good to portray. And the same spirit that caused Petrarch to defy the laughter of his contemporaries by climbing a mountain simply for the sake of the view from its summit caused painters gradually to introduce landscape into their art.

First, it was used incidentally in the religious pictures, sometimes merely as a decorative device and at others significantly, to place the scene out of doors. Its early treatment was not very intensive, a straight line topped off with a flat leaf often representing a tree, the other factors of the landscape, if indeed any others were introduced, receiving similar attention.

But landscape was represented more and more until finally it came to be used independently and then came the fuller development of this important branch of the art.

London's Indifference to Art

A strong word of protest is uttered against the manner in which the Imperial War Museum pictures are displayed at the Crystal Palace, London, by the *Architects' Journal* of that city. During a recent visit it was noticed that there is no guard-rail of any kind in front of the canvases, the great majority of which are unglazed. Hence there is nothing whatsoever to protect them from damage. If the public were properly regardful of national art possessions this would not matter very greatly; but unfortunately a becoming respect for art is not one of the distinguishing traits of the British public, who, consequently, must be protected against themselves. It fills one with a sense of utter despair to see, as seen recently, these great canvases, mostly by highly distinguished artists, laid open to mutilation by the thoughtless crowd. In one instance might be observed a burly member of the proletariat in the act of reclining gracefully against a fine canvas, which bulged in perilously towards the wall, the while his offspring amused himself by scratching off as much paint as he could with his finger nails. Surely, reflects the editor, in no other country but England would such a thing be possible. No other nation (looking at the matter from the material point of view alone), would be content to see the things which it has bought at great cost deliberately placed in such a position as to invite, even to provoke, destruction. But beyond that there is the art aspect of the matter. The criminally careless manner in which most of these pictures is displayed is a national disgrace and an affront to the artists themselves. It is only hoped that prompt action will be taken to protect and preserve these art records of the Great War before they become irreparably mutilated.

Electrifying French Plants to Save Coal

The present coal shortage and the realization that great economy will be necessary to avoid an even greater shortage of fuel has caused considerable activity in the work of electrifying industrial districts. In the Upper Marne, the vicinity of Wassy is to be electrified to within a short distance of Nogent and in the Loire district, where manufacturing is almost at a standstill, there is great activity in the installation of electric units. Work of electrifying industrial districts in the Meurthe and Moselle is progressing rapidly.

Much of the electric power will be state owned and operated. The power plants at Mohon, Sedan and Stenay are to generate 120,000 volts and will connect with stations in the Briey Basin. Later, it is planned to connect them with the hydro-electric plants of the Rhine Valley. A line is now projected from Sedan-Bazeilles to Montlibert, which will utilize power generated by old German canals, estimated at 40,000 volts.

Northwest Timber Situation

The amount of timber cut each year from the forests of the United States is about three times the annual growth, it is declared by the National Bank of Commerce in New York in a review of the American lumber industry published in the August number of its magazine, Commerce Monthly. Lack of an adequate national forestry policy, together with speculation in privately owned timber lands and the absence of co-operation within the industry itself, have all combined rapidly to reduce the country's timber resources. Provisions for reforestation up to the present have been entirely inadequate and the oncoming growth is ordinarily of inferior species and grade.

"It is estimated that the United States originally possessed 850,000,000 acres of timberland, of which only about 545,000,000 acres remain," Commerce Monthly says. "The original forest acreage contained approximately 5,200 billion board feet of merchantable timber. The latest estimate of timber remaining is 2,826 billion feet. Of this difference about one-third has been lumbered, one-third destroyed by forest fires and one-third wasted."

Theory and Pratice in Cement Construction

Practically half the strength of concrete as a structural material is lost in the ordinary job because of mistakes made in laying it, according to Lieutenant H. C. Boyden, who lectured on the subject before the Engineer's Club, Seattle.

The greatest common mistake in the laying of concrete is the use of too much water in the mixture, said Colonel Boyden. It has been proved by countless tests that the strength of concrete falls off very quickly with the addition of too much water. We have come to the conclusion that the smallest amount of water should be used which will give a workable mix. Theoretically, you can have too little water, but practically it is almost impossible. Fifty to 60 per cent. of the strength of ordinary cement has been wasted by the addition of too much water in the original mixture.

However, after the materials are in place, concrete cannot have too much water. Unless setting concrete is kept constantly moist it will lose about half its potential strength. The time of mixing is also an important factor. Concrete increases in crushing strength rapidly as it is mixed up to 60 seconds and more slowly after that, but no batch should ever be laid which has had less than a minute mixing.

Experience has shown that pressure on the concrete before it has set also has a good effect on the amount of load it can stand up under. However, we believe that this is due almost entirely to the amount of water squeezed out, and is proportional to it. Warmth and water will increase the crushing strength of the concrete and consequently the amount of wear it will stand, if applied during the time of setting. This period should never be shorter than 14 days, and if possible should be made three weeks. The temperature of the mixing water, however, has little to do with the strength of the resulting material.

A convenient test for the cleanness of the sand used in cement, is made by shaking the sand up in a bottle containing a strong solution of caustic-soda, said the speaker. If the liquid becomes black, the sand is unfit for use, and the contractor is throwing away much of the wearing qualities of his material.

We have come to the conclusion, he continued, that a contractor should begin a job by designing the strength of the concrete he will use, and then adhere to that type. As, for instance, there will be times when he will wish to sacrifice strength in order to have a material which is plastic. And at the same time we feel that the contractor at present is not getting more than 60 per cent. of the strength from his concrete which it would produce if he were to take the above facts into account.

The Art, Architecture

As painting is art in manual expression, poetry and music art in language and sound so architecture is art in building. And it is not a question of what,

but how. A bungalow might be an excellent example of architecture, while a very large building might have no more relation to architecture than the wail of an infant to a Brahm's Symphony.

It is a good indication to note that the daily press is emphasizing the importance of good architecture. Take this example from the Houston *Chronicle* as an instance.

Architecture is an outgrowth, a development of the early crude caves and huts of man. Like the other arts it started with the application of aesthetic interest to natural needs. Every spire, every dome, practically every element of the various styles reverts back to some natural shape or form, something in the early shelters. But the art begins where man, thinking not only of the practical need for shelter branched into the decorative, pursued beauty and strove for interpretation in the construction of his home. And the very earliest attempts at architecture show the desire to make pictures, stone pictures out of that which was being constructed. These were pictures not primarily decorative, but representative, significant above all else. For instance, pillars carved out of the stone wall would illustrate the support of the ceiling, satisfying the eye and pleasing the senses.

And though this is at best a hint, it is the key to architecture as an art—representation without of that which is within. And in so far as a building expresses in its construction its purpose, and by indentations, windows, pillars and projections indicates its inner divisions into floors and rooms, in so far as its construction is representative and symbolic as well as pleasing to the eye, it may be ranked a work of art.

The Gasoline Baby

There is righteous indignation printed in the Public Ledger on the substitution of motor cars for babies and garages for nurseries now noted throughout the country.

When flats came in children went out, it declares. More and more individual houses, too, are being built on child exclusion principles; the nursery distinctly minus, but the garage very much plus. People must have a car; the car must have a home, and there you are.

Sometimes the builder tucks it away under the kitchen floor, where it greatly reduces the domain of our ancient autocrat, the furnace, although outshining the same by reason of a more polished color scheme and a full blooming double doorway. Or it may be separated from the house proper by a cemented open space. That space, formerly a fenced-in backyard with something of privacy and individuality, now becomes merely an approach to engine snorts, and gasoline odors.

Does the average home today afford a playroom, where the rocking horse may snort and roar, the doll's house enjoy its daily refurnishing and the lead soldiers perish in platoons all gloriously? It does not—but it has a garage. Isn't there somewhere a room, or at least an attic, happily possessed of a shabby atmosphere and a tattered welkin with a cracked and overworked ring? There is not; but there is a place to keep the car. No single spot where on rainy days the gang may hold forth. Not one. The tiny table and tiny dishes—all past and done. Nurseries don't obtain any more. The busy little folk are turned out on the streets.

Apparently the occupants of these modern dwellings are expected to run to cylinders instead of to children. Possibly house builders have become followers of the Sanger cult! If so, they will defeat their own ends, for lacking a coming generation, a rising crop, so to speak, who will buy their houses?

Robbing the Junk Pile

Few persons realize the amount of material scrapped on the average construction job that could be salvaged if a little thought and study were exercised, which in these days of high prices and scarcity of material is worthy of consideration, writes V. H. Wilkes, in *Successful Methods*.

The writer, who has charge of the construction plant and storage yard for one of the largest engineering corporations in the East, was endeavoring to clean up the congested condition of its yard and discovered under some tarpaulins a number of kegs of nails which had been shipped into the yard upon completion of work and return of equipment, which were the accumulation of a number of jobs.

Upon investigation it was found that practically all were badly rusted and not fit for use in this condition. During the further investigation of the equipment an old 10 cu. ft. concrete mixer with gasoline engine was noticed which was in such condition that it would not mix concrete or pay to repair. After issuing orders to retire this mixer to the scrap heap it was decided that the outfit might possibly be put to some use as a rattler or tumbler for the purpose of cleaning the rusted nails. Without cutting out any of the mixing blades or changing the drum in any manner about three kegs of nails, a quantity of iron borings and rough dry sand were put through the mixer with a result that approximately 3,500 pounds of nails were salvaged and have since been used on construction work. The machine was operated exactly as a mixer except when discharging a sieve was placed under the discharge

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chute which separated the nails from the iron borings and sand.

This plan proved so successful in cleaning the rusted nails that a considerable quantity of cast iron inserts, universal form clamps, bolts and numerous items have been cleaned and rescued from the junk pile.

If it is necessary after cleaning any material by the above method to store until such time as it can be used it is a good plan to put it through the machine the second time, using instead of iron fillings and sand a quantity of sawdust saturated with a cheap form of oil which will oil up the articles cheaper and better than when applied by hand.

The Sociological Effects of the Present Housing Situation

The rent raises in Manhattan are reported to be much greater among the rich than among the poor, because the rich won't go to court to fight advances greater than the 25 per cent. which the law allows. In some of the well-to-do neighborhoods rents are quoted at $1,000 a year per room, and men on $5,000 salaries are said to be moving to the country or to Brooklyn.

One result of this is that the charitable organizations are getting their subscriptions cut in halves or quarters, if not cut off altogether. And the demands on the charitable societies are heavier than ever before because they are now asked to help pay rents, where heretofore the semi-dependent have only askd for help on food, medicines and occasionally for clothes on which workers might be able to hold their jobs. The people who don't ask for help meet their rents by taking in lodgers or boarders in such numbers that not merely the health but the morals of the families are endangered. The charity workers report two families each with children in three-room apartments and others in which the halls are utilized at night for cots for lodgers.

The enlightened people of New York have spent years in fighting dark-room tenements and in seeing that the requirements for sanitary plumbing and for decent family privacy were enforced. In that way the fight against "the white plague" has been waged and the death rate has been cut down. Now in the housing congestion these advances of ten years are to be swept away in one year, unless the quick building of some thousands of tenements can be brought about. When the standards of health and morals have been broken down the building of new tenements will not restore them automatically. There must follow another long campaign of education to see that the promiscuous living arrangements brought about by congestion are not continued and in the meantime the death rate will go up and the recruiting for vice and crime will go on.

The building of new houses is in part an economic problem, but only in part. It is a social problem as well and in it are involved the standards of civilization of a city which has brought itself to the front rank among world cities by long and persistent effort.

National Registration Board to Meet in St. Louis in November

The first formal meeting of the National Council of Architectural Registration Boards will be held in St. Louis, Missouri, on November 18 and 19, 1920.

All architectural registration or licensing departments, boards or committees throughout the United States are invited and urgently requested to send representatives to this meeting in St. Louis.

While membership in the Council is restricted to the legally appointed representatives of the registration or licensing authorities of states having registration or license laws, the Council would be glad to welcome the attendants at the Council meeting of committees of architects from states having no registration or licensing laws.

Legislative Committees from states having laws pending will find the proceedings of the Council very helpful and instructive. Among the papers to be presented will be a report of a committee appointed at the Washington Conference to make a careful, analytical, comparative study of the various registration laws now in force in the various states. Efforts will be made to harmonize these various requirements so as to make easy reciprocal transfer of registration from state to state and thereby facilitate interstate practice.

A desirable outgrowth of the Conference will be the formation of some sort of clearing house of information with reference to the records of architects asking extension of registration from one state to another. It is hoped that the Council may be able to recommend a uniform law, which may be adopted by the various states.

Committees and Registration Officials are urged to make arrangements for representation at the earliest possible date and notify the Secretary of the Council, furnishing the names and credentials of their official representatives. Emil Lorch, chairman, 718 Church St., Ann Arbor, Michigan. E. S. Hall, secretary, 1107-64 E. Van Buren St., Chicago, Illinois.

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Calling Them Master's Rooms Makes It Cost Much More

A snappy account of his personal experience of the renting situation is set down in The New York Tribune by Heywood Broun. He states in part:

Once upon a time you got a month rent free and the man would ask you if he should paper the parlor in pink or blue. In those days the advertisement read "Seven rooms and bath, $65 a month," and if you spoke sharply to him he would take less. Today the same apartment is listed "EXCEPTIONAL OPPORTUNITY—Polonius Terrace, nine beautiful rooms and exclusive bath in select residential neighborhood. Three masters' bedrooms and two maids' rooms. Everything up to date. Free use of the elevator before noon. Might rent to refined people of the highest standing for $450. Must be small, blonde, adult family with wedding certificate. Weight not to exceed 192 pounds net. No children. dogs or Ford automobiles. Business, social and medical references absolutely essential. No Unitarians. Apartment to be seen, by appointment only, from 3 to 3:30 on alternate Thursdays in June."

The rent crisis is to a large extent a matter of morale. In some way or other not only the landlords but all of their agents have acquired what is known on the stage as authority.

When we went to Polonius Court we might possibly have confounded the young earl by remarking that the two maids' rooms looked remarkably like clothes closets. We lacked courage. In fact, we were unnerved from the very moment he pointed to the small cubicle off the airshaft and said, "You see, this master's bedroom opens on the court." Our only excuse is that we had never seen a master's bedroom before. We have always set our heart upon being masterful, but we can't afford one of the bedrooms.

And yet, for all our envy, it seems to us that the development of the master's bedroom is a sinister movement in American life. Before the days of the suffrage amendment nobody would even have considered the possibility of there being more than one master's bedroom in any house or apartment. Now we sometimes see advertisements which offer three, four and even five masters' bedrooms. All we can say is go on your luxurious way and enjoy your steam heat and your three baths and your exclusive neighborhood and your five masters' bedrooms while you can, but remember that a house divided against itself must fall. Still, even if it did, we don't suppose the rent would follow. If Newton had thrown a lease into the air instead of an apple he never would have discovered gravity and it would still be something one had to learn by experience, which would be a mighty hard school for the tenants in the Woolworth Tower.

French Art Losses Due to the War

One of the most interesting items in the latest inventory of the losses of France through the war is that which tells of the extent of the damage to her art treasures and historic monuments. The official estimate for this loss, which has been obtained by the Paris information service of the Bankers Trust Company, is placed at over $125,000,000.

This figure, which has been recently calculated for the information of French minister delegates to forthcoming international conferences, has been arrived at after an exhaustive examination of the ruins of historic monuments, statues, churches, museums and their contents. The irreplaceable nature of these losses is indicated by the sum of 600 million francs which is set against "moral injury."

"This sum of 600 millions," explains the official text, "is an approximation of the loss the French people have sustained by having lost forever works of peculiar value because of their beauty and historic associations."

In order that a fair statement of values might be made the art commission sets forth the losses in terms of both pre-war and post-war currency, as follows:

	1914 value, francs	1920 value, francs
Historic buildings (750 in all)..	300,000,000	1,200,000,000
Historic monuments	25,000,000	50,000,000
Museums	15,000,000	30,000,000
Moral injury	300,000,000	600,000,000
Total	640,000,000	1,880,000,000

The 640,000,000 francs of losses, on the basis of pre-war values, are equal at normal exchange, which then prevailed, to about $128,000,000.

An estimate of the loss in stolen or damaged jewelry and precious stones is placed at 1,119,000,000 francs, present values.

The loss in personal property and objects of art owned by private individuals has been placed at 4,500,000,000 gold marks.

New York Society of Architects

This society held its first meeting after vacation on Tuesday evening, September 21, at the organization's headquarters, the United Engineering Societies Building, West 39th street, Manhattan, President James Riely Gordon in the chair. There was a goodly number of members present.

Extended discussion took place on the continued depression in the domain of building and architecture, this being attributed mainly to prevailing un-

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rest and luxurious tastes among mechanics and to profiteering on the part of material men.

The over-shadowing and practical extinction in large part of the architectural profession by engineers and construction companies, which has been in evidence for some time past, was commented upon at length; and Secretary Zobel urged upon the meeting, as a measure of self-defence, the wisdom of advertising—a practice now sanctioned by the American Institute of Architects and the profession generally. The feeling was that more attention should be paid than has hitherto been done to giving publicity to the work both of individual architects and to that of the body as a whole.

Vice-President Fisher called attention to the proposal to appoint a City Architect, and on the speaker's motion it was resolved that the Society disapproves of the proposed appointment, on the ground that the interests of the public will be best served by the employment, in each case as it arises, of individual architects of recognized standing and ability.

The proposal, now before the Legislature, to relieve the present lack of housing accommodation by adding one story to existing tenement houses throughout the city was discussed at length; and the general opinion was expressed that while in itself desirable the proposition is impracticable, owing to the excessive cost of giving effect to it.

Five applicants were voted to membership, and several additional names reserved for further consideration.

The October meeting of the Society will be preceded by a dinner and fall rally of members.

Weekly Review of the Construction Field

With Reports of Special Correspondents in Prominent Regional Centers

THE credit situation has continued, during the period ending September 15, to evidence in a substantial measure the improvement which had become apparent a month ago. There has not, it is true, been any easing of credit. Banking loans as reported by the National Bank of Commerce in New York have increased in response to seasonal needs; there has been no relaxation in commercial money rates; and little change in this situation can be expected until the major requirements of the crop-moving season has been met. Nevertheless, substantial progress has been made in overcoming the difficulties in the credit situation.

While loans are now expanding in response to seasonal needs, as these seasonal requirements are liquidated a considerable reduction in the volume of outstanding credit may be anticipated. Meanwhile, through the shifting of credits and through the facilities of the Federal reserve system, pressure on the banking facilities of particular sections is being distributed throughout the banking system and the strength of the credit structure as a whole is absolutely sound and unimpaired.

A number of factors have facilitated the improvement in the credit outlook. As the continued improvement in transportation permits more normal movements of commodities, the mobility of credits is gradually being restored. Progress is being made in the liquidation of commodity stocks and of loans against them. While the downward trend of prices involves current difficulties, it is a movement toward greater rather than less stability in both the credit and the general business situation, since it tends to reduce the pressure on banking facilities and at the same time to stimulate the large potential demand for goods which increasingly high prices had impaired. In contrast with the movement in progress a year ago, therefore, the general trend of business conditions within the United States is in the direction of increasing soundness and stability.

In many important groups of raw products there has been a steady downward trend in prices. In some lines this reduction has passed on to the finished product.

Unless untoward social and political developments should take place, it now seems likely that in the case of most commodities the period of rapid price adjustment has passed, and that fluctuations from now on will be through a gradually narrowing margin. Present price movements, however, must be interpreted with the greatest care. Cases in point are those commodities the prices of which appear superficially stable, but in which, as a matter of fact, almost no business is being done. In such cases, actual values cannot be known until trading operations are resumed.

While price changes were so radical, curtailment of manufacture and the unrestricted course of mer-

chandizing was inevitable. While slowly receding prices will tend toward the ultimate attainment of normal conditions, it will be just as necessary that business be carried on thoughtfully and conservatively.

The United States is in a more favorable position than any other country in the world. If a mutual basis for transactions is found in the immediate future, labor will be kept reasonably well employed, and manufacturing, commercial and financial operations will be maintained at a healthy level. Delay in finding such a mutual basis is not only unwise but it might well result in entirely unnecessary industrial, financial and social disorganization.

August building statistics reported from the larger cities of the country show, according to the *American Contractor,* that while there has been no perceptible gain over the preceding month's activity, the mere fact that there has been no further recession is encouraging because during August the unfavorable influences hampering building have been intensified. During the month the advanced freight rates resulted in additions to the high prices of materials. The fact that building permits show no recession coupled with the fact that a better condition in transportation can reasonably be expected to take place, leads to the conclusion that the last four months of 1920 may see augmented plans for much needed building.

The housing shortage has become an issue of national importance. The unwillingness of banks to loan on real estate mortgages for housing and the rapacity of owners of available housing of all kinds have combined to create conditions that menace public health and safety. State legislatures are discussing these problems from points of view both practical and impractical, and in sheer despair of finding an early and complete solution, are preparing to put the whole matter up to Congress. Meantime, those who have more closely studied the situation, not locally, but broadly, all over the country, are firm in the belief that the basis of a complete remedy lies in tax exemption and in legislation that will prevent landlords from continuing the present orgy of rent boosting.

The shortage of apartments in New York City is variously estimated from 40,000 to 160,000. One hundred garages and five theatres to one apartment and one dwelling house is the proportion in which building plans were recently filed in Manhattan, states the mid-September Bulletin of the National Lumber Manufacturers' Association. To the intelligent reader this statement will need no amplification. It clearly shows that it will ultimately become necessary to enact legislation that will prevent what at this time is such a large proportion of non-essential building.

In the material market in New York there are indications that materials are available from their sources and are moving more freely. The demand, however, is still light. A reason for this is seen in the high wage scale which along with other conditions already referred to deters the prospective builder. There seems to be a slight tendency toward lowering of the prices of brick, particularly in the Hudson River district.

The New England correspondent of THE AMERICAN ARCHITECT in the usual weekly review of that section reports:

In view of the seriousness of the housing situation, representatives of the building trades' council of Greater Boston and elsewhere have pledged themselves to assist Mr. John F. Walsh, the newly elected chairman of the National Association of Builders' Exchanges, which has been combined for the sole purpose of devising ways and means to bring pressure to bear to relieve a condition in transportation that is now causing general apprehension.

In discussing his election, Mr. Walsh said: "Now that the winter season is approaching, contractors feel some little consideration is due them by the Interstate Commerce Commission in order that large operations may not be compelled to shut down entirely for want of necessary materials to keep men employed."

Shortly after the election, Mr. Walsh got in communication with representatives of the United Building Trades' Council of Greater Boston and the State Council of the building trades. They heartily offered their co-operation in the matter.

That money has definitely turned easier would seem to be indicated by the difficulty note brokers find in obtaining the best grades of commercial paper. With the appearance of time money on stock exchange collateral for the first time in a year, it would seem that at least high interest rates have satiated the demand for credit. Call money, another index to money conditions, is easy. In Boston it stands at the usual 8 per cent. which has prevailed for months, whereas in New York it opened at 7 per cent. and yielded to 6 per cent.

Statistics of building and engineering operations in New England show that contracts awarded from January 1 to September 15, 1920, amounted to $242,058,000 ,as compared to $147,850,000 for a corresponding period in 1919; $125,236,000 for 1918; $151,681,000 for 1917; $146,636,000 for 1916, and $124,502,000 for 1915.

(By Special Correspondent of the American Architect.)

SEATTLE.—Until the Presidential elections are over the building trade of the Pacific coast may show no symptoms of activity. Among the lumber

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mills, the architects, jobbers of cement, steel, brick and plaster the feeling is the same, that business conditions will warrant no new commitments until the unsettlement that precedes and follows a Presidential year has been definitely put out of the way. After this there will come the annual stock taking, and it is regarded as highly probable that the year may elapse without any improvement in the outlook.

The most serious handicap on the Pacific coast to prosecution of needed building projects is the halting and uncertain delivery of essentials in materials. The scarcity of small sizes of steel pipe, now in the third month of an abnormal and dislocated basis, is preventing home and apartment house projects from closing. In this field the half and three-quarter-inch galvanized pipe supplies 90 per cent. of the home and apartment needs, but unfortunately these are the sizes that are most difficult to get. Advices from the mills in response to pleas of jobbers are to the effect that no promises will be made henceforth to the end of the year as to the approximate date of acceptance of orders for steel pipe.

Jobbers have been compelled to buy from each other and to move the pipe from one city to another in widely separated points in the attempt only to partially meet the demand. Many houses are awaiting pipe to complete before winter sets in.

The situation as to nails is easier, as forecasted in these columns when the mills tacked on a higher price. The claim of the mills was that there was no profit in the 6 and 8 common, shingle and finishing nails at the old price and that the heavier tonnage yielded profit. The shortage is less keen, but the demand has also fallen off.

There are no cement or plaster stocks, and cement and steel pipe on the coast are about on a parity of shortage. More plaster board and patent roofing is offering than is required and the market is unsettled. Fire clay and brick is plentiful.

Prices are steady in vitroware and enamelware and the demand slack, indicating a lessening of new building projects over the territory. There are no stocks on the coast. One ship of the Isthmian fleet is due within a week with steel pipe from the Pittsburgh district, but jobbers hold so many back orders that the shipment will be swallowed up and still leave the market short.

The fir lumber market is undergoing one of the dullest periods in 25 years. The eastern building demand, on which the industry depends as an avenue for the bulk of its output, reports that southern pine mills are cutting under prices of Douglas fir. The new emergency rail rates have effectually shut out fir from its former eastern outlets in favor of southern pine, and while conferences between the manufacturers and the carriers in regard to petitioning the Interstate Commerce Commission for a rate revision and the restoration of competitive conditions have been arranged, the process is expected to be a long one and there seems to be no hope that the subject can be reached this year.

Average costs of standard building sizes at the mill this week are as follows: One by four No. 2 vertical grain ceiling, $61.50 to $69; No. 3, $48; 1x4 No. 2 and better slash grain flooring, $43 to $55; stepping No. 2 and better, $75 to $80; No. 2 and better finish 1x8-10 ft, $64 to $71. Ceiling, 5-8 by 4 No. 2 and better is $51; No. 3, $37.50. Drop siding, 1x6 No. 2 and better is $45 to $56, and boards and shiplap No. 1, 1x8-10 ft., $24.50 to $31. No. 1 dimension, 2x4 12-14, surfaced and edged runs from $22.50 to $26.50. Plank and small timbers 4x4 12-16 surfaced four sides is $26.50 to $30.50, with 3x12's at $26 to $31.

SOUTH FRONT, HALFIELD HOUSE, HERTS, ENGLAND